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CIRCUMSPICE

# GENERAL VIEW

OF THE

# AGRICULTURE

OF

# DERBYSHIRE;

WITH

OBSERVATIONS ON THE MEANS OF ITS IMPROVEMENT.

DRAWN UP FOR THE CONSIDERATION OF

*THE BOARD OF AGRICULTURE*

AND INTERNAL IMPROVEMENT.

## VOL. II.

CONTAINING A FULL ACCOUNT OF

The State of Property and its Occupancy, the Buildings, and Implements used in Agriculture:

The Improvement of Lands, by Inclosing and converting of Waste and Open Tracts, Draining, Embanking, Irrigating, Manuring, Marling, Liming, &c.

The Culture and Cropping of Arable Lands with the various Grains, Roots and useful Plants, the Management and Conversion of Grass Lands; of Gardens and Orchards, and of Woods and Plantations; under which last Head, the Scarcity of large Timber, its Profit to the Owner, and means of future Increase, by Pruning, &c. are fully considered.

ILLUSTRATED BY FOUR PLATES.


BY JOHN FAREY, SEN.

MINERAL SURVEYOR,

OF UPPER CROWN-STREET, WESTMINSTER.



*LONDON:*

Printed by B. M'Millan, Bow-Street, Covent-Garden:

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# ADVERTISEMENT.

THE desire that has been generally expressed, to have the AGRICULTURAL SURVEYS of the KINGDOM reprinted, with the additional Communications which have been received since the ORIGINAL REPORTS were circulated, has induced the BOARD OF AGRICULTURE, to come to a resolution, to reprint such as appear on the whole fit for publication.

It is proper at the same time to add, that the Board does not consider itself responsible for every statement contained in the Reports thus reprinted, and that it will thankfully acknowledge any additional information which may still be communicated.

# PREFACE.

THE first Chapter and Volume of this Report, treating principally, and at considerable length, on its *Mineral Concerns*, has now been a year and a half before the Public; and I am happy to hear from various quarters, that it has met a candid and favourable reception, among the Gentlemen particularly interested in its contents, in the County of Derby, the parts of the adjacent Counties which it embraces, and elsewhere. The present Volume, and the following and conluding one, which is yet in hand, have unavoidably been delayed much beyond my wishes and intentions, by the arrears of Professional Business which had accumulated on my hands, during the long period occupied in the Survey for, and in the arranging and printing of, the first Volume: the whole will soon I trust now be completed, and the immense pains which I have taken, will not I hope be found to have been bestowed in vain.

The Board having thought proper to affix their usual Advertisement to the Volumes of my Report, styling it a *reprinted* Report, in allusion to the short Report on this County, drawn up by Mr. Thomas Brown of Luton, in Bedfordshire, in the year 1794, and printed in quarto

with wide margins, on which, Communications were solicited from the Agriculturists of the County; it becomes necessary for me to state in this place, as mine and the Board's apology, to those Gentlemen who took the trouble to return the copies of the Original Report, either to the Board or to Mr. Brown, containing their several marginal corrections and additions, that none of such are acknowledged or inserted in the pages of this Report: that the same is owing to the whole of such corrected copies having gone into Mr. Brown's hands soon after their transmission, and my repeated applications thro' all the proper channels, having failed, in procuring the return of them; and I would add, that I have copied or taken nothing from such Original Report, without expressly quoting it.

The printed "Plan" furnished by the Board to their several County Surveyors, has, as closely as possible, been followed in the arrangement of my materials herein: on several of these heads the information will be found but scanty, owing principally, to the County furnishing little to remark on, under such heads, and in some rarer instances, as I trust, to my not having met with the proper Persons to communicate thereon, or having unintentionally neglected to enquire and note the facts or practical opinions of such, as might have given useful information: whatever my Notes do furnish, I have been very careful

to

to give, as concisely, clearly and impartially as possible, on both sides, where differences of opinions exist; and have been careful to mention Names, Places, Dates, and other particulars for further enquiry, into most of the facts or practices that are mentioned or described.

It may be proper to remark, to practical Agriculturists who may be disposed to try, or to adopt any new or improved Practices which are mentioned in these Volumes, and may find my descriptions or mention of such, defective in some minute yet essential particulars to their practical application, that the collecting and detailing of all such *minutiæ*, had I been capable of so doing in every instance, would have exceeded my time, or the reasonable limits within which these Reports must be confined; and that from the number of instances mentioned, in the greater number of cases, opportunities may be afforded, of going to see the operations or practices on the spot, which is ever the most certain and satisfactory method of acquiring a perfect knowledge of new practices: where this is impracticable, owing to distance, I venture to suggest, from the almost characteristic readiness of the Gentlemen of this County to communicate information, that a frank'd or post-paid Letter, requesting more precise details on the particular points wherein I may have been defective, will meet with a ready and respectful attention; and for such purpose,

 the

the residence and proper *address* of each Person with whom I have communicated on agricultural subjects for this Report, will be found in this Preface, and the bearings of their residences from the Post Towns are added, in order to find them the more readily; those who have assisted my Mineral Inquiries, being already so mentioned, in the Preface to the first Volume, except a few added herein, p. xx.

In order to give greater precision to the local details in these Volumes, such as no Map or Gazetteer that can be procured will fully supply, I have been at much pains to present in this Preface, an Alphabetical List of all the *places* in Derbyshire, except perhaps a few small assemblages of Cottages here and there, and single Farms or Houses, with reference to the Parish and Hundred to which they severally belong, according to the Alphabetical Lists of Parishes and Hundreds given in the first Volume, page 78, and corrected, where erroneous, in this Preface, p. xix.

In mentioning *places'* names in this Report, some one of those in the Lists above-mentioned, in Derbyshire, is generally to be understood, unless the contrary is expressed; and in speaking of *prices* of articles or other things where the *date* is material, and has been omitted by mistake, it may be proper to recollect, that the Notes for this Report were collected between September 1807 and December 1809, except a few subse-

subsequent ones, which I have been careful to distinguish.

To some persons an apology may perhaps seem necessary, for having introduced or referred to so many of the improvements or concerns of the late Duke of Bedford, in *Bedfordshire*, and which I hope will be found, partly, in the identity of certain persons employed in conducting the Improvements of the two Counties, viz. Mr. Pontey, Mr. Elkington, Mr. Dowdswell and his Son: that where my own opinions seemed necessary to be stated, it might be allowable and even proper, to particularize the facts on which they were grounded: and to which may be added, the near prospect now, of the GENERAL REPORT *on the Agriculture of the Kingdom* being entered on and completed, in which it is hoped, that some of these particulars may be noticed, without appearing there, out of place.

During an employment of some months in the County, of late, assisted by my Son William, on a minute *Mineral Survey* of the Parish of *Ashover* and its environs, for Sir Joseph Banks, Bart. the Maps and Sections, and a full account of which have been prepared for the *Geological Society* of London, and may be expected to appear in their next Volume of Transactions; and in consequence also, of much communication and correspondence with persons conversant in the

Mineral concerns of the County, since the publication of my first Volume: a great many new particulars, and some corrections wanting, of a few of those already given, have come to my knowledge, the most material of which last, as well as the corrections or additions which may appear necessary in the present Volume, shall be given with that which is to follow, to complete my present engagement with the Board and the Public.

Among those Gentlemen who have particularly aided my pursuits, and favoured the views of the Board, in revising and examining the numerous facts stated in my first Volume, respecting the Stratification and Minerals of the County, and in *candidly pointing out the errors so detected* therein, I beg to mention here, Mr. *Elias Hall*, Fossilist and Petrifaction-worker, of Castleton, who, after revising my Mineral Observations with great labour, on all the great Limestone Tract north of Winster, and in some of the adjoining Shale and Grit Tracts, has completed several exact *Models of this District*, which exhibit the face of the Country, the Stratification, Mineral Veins, Faults, &c. &c. in a very natural and perfect manner; some of which Models, in return for the kind services of this ingenious and deserving Individual, I have undertaken to show at my House; or they may be seen at Castleton, together with a series of the several

veral *Minerals* of this curious District, collected by himself, and identified as to their localities, by references of these Models, in a very superior manner to what was ever before practicable. Adequate encouragement to Mr. Hall, in the disposal of these Models and his Fossils, might perhaps induce him to examine the southern half of the Limestone District, with equal industry and care, and to include the same in one or in a separate Model.

Mr. *John Gratton*, Jun. of Car-house, in Wingerworth, has carefully examined the Lordship of Wingerworth, and made a complete Mineral Map of it, for Sir Thomas Windsor Hunloke, Bart. and furnished me with a copy of the same.

Mr. *Matthew Frost*, Jun. of Calver, has sent me a Map of the Mineral Veins in that and Hassop and Rowland Liberties, &c.

I have bestowed considerable pains on the alphabetical *Index* to the several matters contained in this Volume, and may hope, that every material subject or thing treated of or mentioned herein, may readily be found thereby; I have repeated therein such articles in the first Index, as most concern the Agriculturist, and throughout, have endeavoured, by references during the printing, to consult the ease of the Reader, and to facilitate the labours of those, who may examine the pages of my Report, in preparing

the several Chapters of the *General Report*, now so anxiously expected.

It remains only to repeat my best acknowledgments and thanks to the Noblemen and their Agents, the Clergymen, Gentlemen, and Farmers, &c. of the County, for the great readiness with which they have communicated and assisted the Board and me, in presenting this View of the present state of so fine a County: and in giving the following List of Agricultural Contributors, I hope that no one will conclude, that I have judged many others in the County incapable of giving equally useful and novel information, with much of that which is presented herein, had I happened to meet or correspond with, or been able to call on such persons, as are omitted herein.

JOHN FAREY, Sen.

*January*, 1813.

## *An Alphabetical List of those Persons who contributed their Assistance and Information towards the Contents of this and the following Volume.*

Agard, Francis, of Burrowash Mills, in Ockbrook, near Derby, East of it (Iron Mills).

Allen, Charles, Bailiff to F. N. C. Mundy, Esq. at Markeaton, near Derby, N W.

Arkwright, Richard, Esq. of Willersley, near Matlock Bath (Cotton Mills).

Bagshaw, Francis, of Hazlebadge in Hope, near Tideswell, N E.

Bagshaw, Sir William Chambers, of the Oaks in Norton, near Sheffield, S.

Bainbrigge, John, of Hales-green in Shirley, near Ashburne, S E.

Bainbrigge, Joseph, of Clifton, near Ashburne, S W.

Bancroft, John, of Synfin in Barrow, near Derby, S.

Bancroft, William, of Barrow, near Derby, S.

Banks, the Right Honourable Sir Joseph, Bart. of Overton in Ashover, near Chesterfield, S W (Mines, Limeworks).

Barker, George, of Darley, near Bakewell, S E (Lead Furnace).

Barker, Thomas, of Ashford, near Bakewell, N W (Lead Furnace).

Barnes, John, of Brampton, near Chesterfield, W.

Bennet, Isaac, Jun. of Over Haddon, near Bakewell, S W.

Berrisford, John, Esq. of Compton and Osmaston, near Ashburne, S E.

Birch, Robert, Esq. of Holme Hall, near Bakewell, N.

Bird, Thomas, of Eyam, near Tideswell, E (Lead Mines and Furnace).

Blackwall, John, of Blackwall, near Wirksworth, S W.

Blaikie, Francis, Bailiff to the Earl of Chesterfield, at Bradby-hall (or Bretby), near Burton, E.

Blore, John, of Callenge-low, near Bakewell, S W.

Bowyer, Thomas, of Waldley, in Cubley, near Ashburne, S W.

Bradshaw, Francis, Esq, of Barton Blount, near Ashburne, S.

Bradshaw, Francis, and Son, of Newton-grange, near Ashburne, N.

Bradshaw, Rev. Joseph, of Holbrook, near Derby, N.

Brain,

Brain, Thomas, Bailiff to Lord Vernon, at Sudbury-hall, near Uttoxeter, E.

Bridden, John, of Middleton in Yolgrave, near Bakewell, S W.

Bright, Mrs. Henrietta, of Inkersall, near Chesterfield, E.

Bright, Paul, of Middle Handley, near Chesterfield, N.

Brocksop, John (the late), of Grass Hill, near Chesterfield, S (Iron Furnace).

Brown, Edward, of Ingleby, near Derby, S.

Bruckfield, Francis (the late), of Alton-hall, near Wirksworth, S. and Derby Town.

Bullivant, Fletcher (the late), of Stanton Ward, near Burton, S (Coal Mines).

Bunting, John, of Bunting-field in Ashover, near Chesterfield, S W.

Burton, Philip, of Church-field in Brailsford, near Ashburne, S E.

Butler, Joseph, of Killamarsh, near Chesterfield, N E (Iron Furnace and Forge).

Buxton, Walter, of Aldwark in Bradburn, near Wirksworth, N W.

Chambers, Benjamin, of Hurst in Tibshelf, near Alfreton, N E.

Champion, John, Jun. of Nether Booth in Edale, near Tideswell, N.

Chesterfield, Earl of, Bradby-park, near Burton, E (Coal-Mines).

Clarke, Joseph, of Willesley, near Ashby-de-la-Zouch, S W.

Clay, George, of Arleston in Barrow, near Derby, S.

Clayton, Thomas, of Stanage in Wingerworth, near Chesterfield, S W.

Cocker, Samuel, of Ilkeston-hall, near Derby, N E.

Cocks, William, of Sandiacre, near Derby, E.

Coke, Edward, Esq. of Longford, near Ashburne, S.

Cottingham, John, Bailiff to the Duke of Devonshire, at Hardwick-hall, near Chesterfield, S E.

Cox, Edward Soresby, of Brailsford, near Ashburne, S E.

Cox, William, of Culland in Brailsford, ditto.

Creswell, Robert, of Iderich-hay, near Wirksworth, S (Drainer).

Creswell, Robert and Richard, of Ravenstone, near Ashby-de-la-Zouch, S E.

Crewe, Sir Henry (Harper), of Calke, near Derby, S.

Devonshire, Duke of, Chatsworth, near Bakewell, E, and Hardwick, near Chesterfield, S E (Coal, Lead Mines, &c.)

Dowland, James, Surveyor and Commissioner, of Cuckney, near Ollerton, Notts. See this Preface, p. 20.

Eaton,

Eaton, William, of Sutton on the Hill, near Derby, W.
Ellison, Mathew, of Glossop-hall, near Glossop, W, Agent to the Honourable Bernard Howard.
Elton, Thomas, of Oakthorpe in Measham, near Ashby-de-la-Zouch, S W.
Emery, Samuel, of Upwoods in Doveridge, Derby, near Uttoxeter, Staffordshire, N E.
Emery, Thomas, of Mansditch in Catton, near Burton, S W.
Eyre, Francis, Esq. of Hassop, near Bakewell, N E.
Eyre, Samuel, of Radburne, near Derby, W.
Fletcher, Henry, of Killis Farm, in Horsley, near Derby, N.
Fox, Samuel, of Thurlston Grange in Elvaston, near Derby, S E.
Freer, Thomas, of Ley-fields in Stretton-en-le-Fields, near Ashby-de-la-Zouch, S W.
Frith, Samuel, Esq, of Bank-hall, near Chapel-en-le-Frith, S.
Garman, John, of Broad-field in Croxall, near Burton, S W.
Garman, William, of Persal Pits in Croxall, near Burton, S W.
Gell, Philip, Esq. of Hopton, near Wirksworth, W.
Gilbert, Joseph, of Stanton in the Stones, near Bakewell, S. Agent to Bache Thornhill, Esq.
Goodwin, George, of St. Ann's Hotel, Buxton.
Gould, Joseph, of Pilsbury in Hartington, near Buxton, S.
Gould, William, of Hanson-grange, near Ashburne, N.
Gratton, John, Jun. of Car-house in Wingerworth, near Chesterfield, S W. (Mineral Map of Wingerworth Lordship, see p. xi.)
Greaves, Charles, of Rowlee in Hope Woodlands, near Tideswell, N.
Greaves, Robert Charles, of Ingleby-hall, near Derby, S.
Greaves, William, Jun. of the Rutland Arms Inn, Bakewell.
Greenwood, Timothy, of the Newhaven Inn in Hartington, near Buxton, S E.
Gregory, John, of Ravensnest in Overton, near Chesterfield, S W.
Gregory, Richard, of Meadow-place, near Bakewell, S W.
Greville, Rev. Robert, of Wyaston, near Ashburne, S.
Hall, Isaac, of the Inn, Castleton, near Tideswell, N.
Hardy, John, Bailiff to Mr. William Smith, at Foremarke-park, near Ashby-de-la-Zouch, N N W.
Harrington, the Earl of, Elvaston, near Derby, S E.
Harrison, John, of Hoon in Marston, near Derby, S W.

Harrison,

Harrison, Richard, of Ash in Sutton, near Derby, W.

Harvey, Thomas, of Hoon-hay in Marston on Dove, near Derby, S W.

Hassall, John, of Hartshorn, near Ashby-de-la Zouch, N W.

Hassall, Thomas, Esq. of Hartshorn, near Ashby-de-la-Zouch, N W.

Heacock, John, of Etwall, near Derby, S W.

Heacock, Philip, of Buxton, Agent to the Duke of Devonshire.

Hickingbottom, William, of Weston Cliff, near Derby, S,

Holland, John, of Barton-fields in Barton, near Derby, W.

Holmes, Anthony, of Stanton in the Stones, near Bakewell, S.

Horton, Eusebius, Esq. of Catton, near Burton, N W.

Hoskins, Abraham, Esq. of Newton Solney, near Burton, E.

Hunloke, Sir Thomas Windsor, Bart. of Wingerworth, near Chesterfield, S (Coal and Iron Mines).

Hurd, Rev. William, of Kniveton, near Ashburne, N. E.

Hurst, Francis, Esq. of Alderwasley, near Wirksworth, E (Iron Furnace and Forge).

Jebb, Joshua, Esq. of Walton, near Chesterfield, S W.

Jessop, William Jun. of Butterley-hall, near Alfreton, S (Iron Furnace).

Johnson, Rev. Nathaniel Palmer, of Wyman's Hill, in Aston, near Derby, S E.

Jowett, Thomas, of Draycot in Sawley, near Derby, S E.

Jowett, Thomas, Jun. and Robert, of ditto.

Kershaw, John, of Hurst, in Glossop, S E.

Kinnersley, Clement, Esq. of Sutton in Scarsdale, near Chesterfield, S E.

Kirk, Thomas, of Bramley in Eckington, near Chesterfield, N.

Kirkman, Benjamin, Bailiff to the Rev. N. P. Johnson, at Wyman's Hill in Aston, near Derby, S E.

Knowlton, Thomas, of Edensor, near Bakewell, E. Agent to the Duke of Devonshire.

Lea, Robert, of Burrow-fields in Walton, near Burton, S W.

Lea, Thomas, of Stapenhill, near Burton, S W.

Lingard, John, of Great-rocks Lodge, near Buxton, E.

Lingard, Joshua, of Blackwell, near Tideswell, S W.

Longsdon, James, of Little Longsdon, near Bakewell, N (Cotton Mill).

Longsdon,

Longsdon, William (the late), of Eyam, near Tideswell, E (Lead Mines and Furnace).

Lovett, William, of Boythorp, near Chesterfield, S.

Lowe, William Drury, Esq. of Locko-park, near Derby, N E (Coal Mines).

Mammatt, Edward, Esq. of Measham, near Ashby-de-la-Zouch, S W (Coal Mines).

Matthews, James, of Loscoe Farm in Repton, near Burton, E.

Middleton, Marmaduke Middleton, Esq. of Leam in Eyam, near Tideswell, N E.

Milnes, John, of the Buts in Ashover, near Chesterfield, S W (Lead Furnace).

Milnes, William, Sen. of ditto, Agent to Sir Joseph Banks, Bart. (Lead Mines).

Milnes, William, Jun. of ditto (Pruning).

Moira, Earl of, Donnington-park, near Derby, S E.

Moore, George, Esq. of Appleby Magna, near Ashby-de-la-Zouch, S W.

Moore, Thomas, of Lullington, near Burton, S.

Morewood, Rev. Henry Case, of Alfreton-park, near Alfreton, W (Coal and Iron Mines).

Morewood, Rev. John, of West Hallam, near Derby, N E.

Mousley, Benjamin, of Honey-Hill in Chilcote, near Ashby-de-la-Zouch, S W.

Mower, Robert, Esq. (the late), of Woodseat's Hall in Barlow, near Chesterfield, N W.

Mundy, Edward Miller, Esq. of Shipley, near Derby, N E (Coal Mines).

Mundy, Edward Miller, Esq. of Walton, near Burton, S W.

Mundy, Francis Noel Clarke, Esq. of Markeaton, near Derby, N W.

Needham Ellis, of Hargate Wall, near Tideswell, W (Cotton Mills).

Needham, Robert, of Perry-foot, near Chapel-en-le-Frith, E.

Needham, William, of Great Hucklow, near Tideswell, N E.

Nuttall, George, late of Matlock, now of Hampton Court, near Leominster, Herefordshire, Agent to Richard Arkwright, Esq.

Nuttall, John, Land Surveyor and Commissioner, of Matlock, near Matlock Bath, N W.—See page 80, Note,

Oakden, Philip, of Bentley-hall in Longford, near Ashburne, S.

Oldknow,

Oldknow, Samuel, Esq. of Mellor, near Stockport, S E (Cotton Mill, Lime Kilns).

Otter, Rev. Edward, late of Bolsover Castle, near Chesterfield, E.

Pearsall, John, of Foremarke, near Burton, E.

Pearsall, William, of Repton, ditto, (Butcher).

Phillips, Richard, of Somersall-Herbert, near Uttoxeter, E.

Pickford, Thomas, of King's Sterndale, near Buxton, S E (Coal Mines).

Plimley, Walter, of Styd-hall in Shirley, near Ashburne, S.

Pole Sacheverel Chandos, Esq. of Radburne, near Derby, W.

Potter, James, of Ilkeston, near Derby, N E (Coal Mines).

Prinsep, Thomas, Esq. of Croxall, near Burton, S W.

Radford, John, Esq. of Smalley, near Derby, N E.

Reeves, Rowland, Bailiff to Sir Rob. Wilmot, Bart. of Chaddesden, near Derby, E.

Robinson, Francis, of Melborne, near Ashby-de-la-Zouch, N.

Robinson, George, of Hope, near Tideswell, N E.

Robinson, James, of Pyegrove, near Glossop, S E.

Rodes, Cornelius Heathcote, of Barlborough, near Chesterfield, N E.

Rowbottom, Thomas, of Lee-hill in Doveridge, near Uttoxeter, E.

Rowland, Samuel, of Mickleover and Rough-Heanor, near Derby, W, and Derby Town.

Sadler, William, of Plesley, near Mansfield, N W.

Sale, William, of Donisthorpe, near Ashby-de-la-Zouch, S W.

Scarsdale, Lord, of Kedleston, near Derby, N W.

Scholefield, Edward, of Barlborough, near Chesterfield, N E (Lime Kilns).

Shore, Samuel, Sen. Esq. of Norton, near Sheffield, S.

Shuttleworth, Ashton Ashton, Esq. of Hathersage, near Stoney Middleton, N E.

Simpson, the Hon. John, of Stoke in Hope, near Tideswell, N E.

Sitwell, Edward Sachaveril Wilmot, of Stanesby, near Derby, N E.

Sitwell, Sir Sitwell, Bart. (the late) of Renishaw, near Chesterfield, N E.

Smedley, Thomas, of Eggington, near Burton, N E.

Smith, Christopher, Bailiff to Edward Coke, Esq. at Longford-hall, near Ashburne, S.

Smith, John, of Linton, in Church Gresley, near Burton, S.

Smith, John, of Repton, near Burton, E.

Smith, Joseph, of Wood-fields in Lullington, near Burton, S.

Smith, William, of Swarkestone Lowes, near Derby, S, and Foremarke-park, near Burton, E.

Smith, William, Bailiff to Wm. D. Lowe, Esq. at Locko-park, near Derby, N E.

Statham, William, of Shottle, near Wirksworth, S E.

Stone, Robert, of Boylstone, near Ashburne, S, and Somersall Herbert, near Uttoxeter, E.

Strutt, George Benson, Esq. of Belper, near Derby, N (Cotton Mills.)

Strutt, George Henry, ditto (Pruning). See page 239.

Thomas, Wooton Berkenshaw, of Boythorp, near Chesterfield, S, and Chesterfield Town.

Thornhill, Bache, Esq. of Stanton in the Peak, near Bakewell, S (Lead Mines).

Tomlin, Robert, late Bailiff to the Duke of Devonshire at Chatsworth, now of Knowchley in Stoke, near Stoney Middleton, E N E.

Toplis, George, of Brassington, near Wirksworth, W.

Vernon, Lord, of Sudbury, near Uttoxeter, E.

Upton, Charles, Esq. of Derby, Agent to Earl Harrington and Lord Scarsdale.

Wall, John (the late), of Weston Underwood, near Derby, N W.

Walton, Thomas, of Repton, near Burton, E.

Ward, John, of Lullington, near Burton, S.

Waterpark, Lord, of Doveridge, near Uttoxeter, E.

Webb, John, of Barton Lodge, near Ashburne, S.

Webb, Matthew, of Donkil Pits in Catton, near Burton, S W.

Wilkinson, Isaac, of Tapton, near Chesterfield, N E.

Wilmot, Sir Robert, Bart. of Chaddesden, near Derby, E.

Wolley, Adam, Attorney, of Matlock Bath. See this Preface, p. 20.

Wood, George, of the Grove Inn, Buxton.

Wood, William, of the Eagle and Child Inn, Buxton.

Woodward, William, of Stanton by Dale, near Derby, E.

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**I beg to supply the following omissions, in my acknowledgments to Mineral Contributors in the Preface to the first Volume, discovered since the publishing of it, viz.**

*Mineral Contributors, before omitted.*

Allen, William, Miner, late of Ashover, now of Bulla-Pill, near Newhaven, Gloucestershire.

Astley, Francis Duckenfield, Esq. Coal Owner, of Duckenfield Lodge, near Ashton-under-line, S.

Blood, David, Collier (now blind), of Bar-gate in Belper, near Derby, N N E.

Bollington, James, Coal-sinker, of Dick-lant in Ashover, near Chesterfield, S W.

Bower, Thomas, Collier, of Dronfield, near Chesterfield, N.

Buckley, Thomas, Sougher, of Crich, near Wirksworth, E.

Cockayne, John, Sen. Sinker, Sougher and Miner, of Dick-lant in Ashover, near Chesterfield, S W.

Doncaster, William, Borer, of the Wheatsheaf in Brailsford, near Ashburne, S E.

Elicot, John, Miner, of Bretton in Eyam, near Tideswell, N E.

Frost, Matthew, Jun. Mine Agent, of Calver, near Stoney Middleton, S E. See p. xi. herein.

Gregory, John, Mine Owner, of Ravensnest in Overton, near Chesterfield, S W.

Hambury, John, Joseph, James and Thomas (four brothers), Sinkers, of Kelstedge, near Chesterfield, S W.

Hartop, Henry, Coal-master, of Attercliff, near Sheffield, E.

Hopkinson, John, Sinker, of Mill-town in Ashover, near Chesterfield, S W.

Longsdon, Thomas, Miner, of Great Hucklow, near Tideswell, N E.

Marriot, Samuel, Sinker, of South Carolina Farm in Ashover, near Matlock Bath, N W.

Morton, John, Coal-master, of West Handley, near Chesterfield, N.

Stephenson, William, Miner and Collier, of Little-worth in Tansley, near Matlock Bath, N W.

Thompson, Stephen, Miner, of Ravensnest in Overton, near Chesterfield, S W.

Warren, Sir John Borlase, Bart. Coal and Mine Owner, of Stapleford, near Nottingham, W.

Wilmot, Thomas, Sinker, of Kelstedge in Ashover, near Chesterfield, S W.

Young, Samuel, Miner, of Watstanwell-bridge, near Wirksworth, E.

*An Alphabetical List of the several* **VILLAGES**, *or smaller assemblages of Houses, and of the* **HAMLETS, TOWNSHIPS** *and* **TOWNS** *in Derbyshire, which are mentioned or referred to in this Report, with the* PARISH *and* HUNDRED *in which each is situate, the latter being abbreviated to save room, viz.* **Ap H** *for Appletree Hundred* (vol. I. p. 78), **B of D** *for Borough of Derby* (I. p. 80), **H P H** *for High Peak Hundred* (I. 80), **M L H** *for Morleston and Litchurch Hundred* (I. 82), **R G H** *for Repton and Gresley Hundred* (I. 84), **S H** *for Scarsdale Hundred* (I. 85), *and* **W W** *for Wirksworth Wapentake (or Low Peak).*

Abbey-dale in Norton S H
Abney in Hope H P H
Abney-grange in Hope H P H
Adelphi in Duckmanton S H
Agnes-meadow in Kniveton W W
Ainmoor (or Danes-moor) in North Winfield S H
Aldercar in Heanor M L H
Alderwasley in (pt of) Wirksworth Ap H
Aldwark in (pt of) Bradburne W W
Aldwark-grange in (pt of) Bradburne W W
Alfreton Town (and Parish) S H
Alkmanton in Longford Ap H
pt of Alkmund, St. pt of Derby Town (and Parish) B of D (the remainder in M L H)
Allen-hill in Matlock W W
Allestry Town (and Parish) M L H
Allsaints, pt of Derby Town (and Parish) B of D
Alpert in Hope H P H
pt of Alport in Bakewell H P H
pt of Alport in (pt of) Yolgrave H P H
Alsop in (pt of) Ashburne W W
Alt-Hucknal Town (and Parish) S H
Alton in (pt of) Ashover S H
Alton in (pt of) Wirksworth Ap H
Alvaston in (pt of) St. Michael M L H
Ambaston in Elvaston M L H
Ankerbold (or Ankerbole) in North Winfield S H

Apperknowl in Dronfield SH
pt of Appleby, Town (and Parish) R G H (the rem. in Leicestershire)
Arleston in (pt of) Barrow Ap H
Ash in Sutton on the Hill Ap H
pt of Ashburne, Town (and Parish) W W (the rem. in Ap H and WW)
Ashford in Bakewell H P H
Ash-gate in Chesterfield S H
Ashley-hay in (pt of) Wirksworth Ap H
Ashop-dale in Hope H P H
pt of Ashover, Town (and Parish) S H (the rem. in W W)
Aston in Hope H P H
Aston in Sudbury Ap H
Aston (upon Trent) Town (and Parish) M L H
Astwith (or Astwood) in Alt Hucknal S H
Atlow in (pt of) Bradburne Ap H
Bakewell Town (and Parish) H P H
Ballidon in (pt of) Bradburne W W
Bamford in Hathersage HPH
Bank in Dronfield S H
Bank-hall in Chapel-en-le-Frith H P H
Barber Booth in Castleton H P H
Barber-fields in Dronfield S H
pt of Bar-gate in Duffield Ap H
pt of Bar-gate in Horsley M L H
Barlborough Town (and Parish) S H
Barlow in Staveley S H
Barlow Bole-hill in Staveley S H
Barmoor in Hathersage H P H
Barmoor-clough in Chapel-en-le-Frith H P H
pt of Barrow (upon Trent), Town (and Parish) M L H (the rem. in Ap H)
Barrowcote in Etwall Ap H
Barton-Blount Parish Ap H
Baslow in Bakewell H P H
Beard in Glossop H P H
Beauchief in Norton S H
Beeley in Bakewell H P H
Beighton Town (and Parish) S H
Belper-gutter in Duffield Ap H
Belper Lane-end in Duffield Ap H
Belper Town in Duffield ApH
Belph in Whitwell S H
Bentley (or Hungry Bentley) in Longford Ap H
Bents in Dronfield S H
Berley in Beighton S H
Biggin in Hartington WW
Biggin in Tibshelf S H
Biggin-mill in (pt of) Wirksworth Ap H
Birchett in Dronfield S H
Birchover in (pt of) Yolgrave H P H
Birchwood in Norbury ApH

Birchwood-moor in Norbury Ap H
Birkin-lane in (pt of) Ashover S H
Birley in Chesterfield S H
Blackwall in Kirk Ireton W W
Blackwell in Bakewell H P H
Blackwell Town (and Parish) S H
Bole-hill in Eckington S H
Bole-hill in Norton S H
Bole-hill in (pt of) Wirksworth W W
Bolsover Town (and Parish) S H
Bonsal nether Town (and Parish) W W
Booth in Hathersage H P H
Boulton in St. Michael MLH
Bowden-head in Chapel-en-le-Frith H P H
Boylstone Town (and Parish) Ap H
Boythorp in Chesterfield SH
Brackenfield in Morton S H
pt of Bradburne Town (and Parish) W W (the rem. in Ap H)
Bradley Town (and Parish) Ap H
Bradley-Ash in (pt of) Ashburne W W
Bradshaw-edge in Chapel-en-le-Frith H P H
Bradway in Norton S H
Bradwell in Hope H P H
Brailsford Town (and Parish) Ap H
Bramley in Eckington S H
Bramley-lane in Alt Hucknal S H
Brampton in Chesterfield S H
Brand in Hartington W W
Brassington in (pt of) Bradburne W W
Brayfield in (pt of) Wirksworth W W
Breach in Denby M L H
Breaston in Sawley M L H
Bredsall (or Breadsall) Town (and Parish) Ap H
Brentwood Gate in Staveley S H
Bretby-common in Repton R G H
Bretby (or Bradby) in Repton R G H
Bretton in Eyam H P H
pt of Bridge-town in (pt of) Darley in the Dale H P H
pt of Bridge-town in (pt of) Darley in the Dale W W
Bright-gate in Bonsal W W
Brimington in Chesterfield S H
Brislingcote in Stapenhill R G H
Brockhurst in (pt of) Ashover S H
Brookfield in Hathersage H P H
Brough in Hope H P H
Brown-side in Glossop H PH
Brushfield in Bakewell HPH
Bubnell in Bakewell H P H
Bugsworth in Glossop H P H
pt of Bull-bridge in (pt of) Crich M L H

pt of Bull-bridge in Duffield Ap H
Bullhurst in (pt of) Mugginton Ap H
Burley in Duffield Ap H
Burnaston in Etwall Ap H
Burrow-hill in Walton RGH
pt of Burrowash in Ockbrook M L H
pt of Burrowash in Spondon Ap H
Burrows in Brailsford Ap H
pt of Burton (South of Trent-bridge) Town (and Parish) R G H (the rem. in Staffordshire)
Butterley in (pt of) Ashover S H
Butterley in Pentrich M L H
pt of Butt-houses in Hartshorn R G H (the rem. in Leicestershire)
pt of Buxton in Bakewell H P H
pt of Buxton in Hartington W W
pt of Buxton in Hope H P H
pt of Cadhouse Lane in Repton R G H
pt of Cadhouse Lane in Ticknall R G H
Caldwell in Stapenhill R G H
Calke Town (and Parish) R G H
Callenge-low in (pt of) Yolgrave H P H
Callow in Hope H P H
Callow in (pt of) Wirksworth W W
Calow in Chesterfield S H
Calow-mill in Hathersage H P H
Calton in Bakewell H P H
Calver in Bakewell H P H
Car-meadow in Glossop H P H
Carsington Town (and Parish) W W
Carter-lane in (pt of) Pinxton S H
Cartlidge in Dronfield S H
Castle-Gresley in Church Gresley R G H
Castleton Town (and Parish) H P H
Catton in Croxall R G H
Chaddesden in Spondon Ap H
Chapel-en-le-Frith (or Bowden-chapel) Town (and Parish) H P H
Chapel-Milltown in Chapel-en-le-Frith H P H
Charlesworth in Glossop H P H
Chatsworth in Bakewell H P H
Chellaston Town (and Parish) R G H
Chelmerton in Bakewell H P H
Chesterfield Town (and Parish) S H
Chevin-side in Duffield Ap H
Chilcote in (pt of) Clifton Campville R G H
Chinley in Glossop H P H
Chisworth in Glossop H P H
Chunall in Glossop H P H
Church Broughton Town (and Parish) Ap H
Church Gresley Town (and Parish) R G H

Church Sterndale in Hartington W W
Cinder-hill in Horsley M L H
Cinders in Whitwell S H
Clay-cross in North Winfield S H
Clifton in (pt of) Ashburne M L H
Clivs in (pt of) Mugginton Ap H
Clod-hall Farm in Bakewell H P H
Clown Town (and Parish) S H
Cobden-edge in Glossop H P H
Coddington in (pt of) Crich M L H
Codnor in Heanor M L H
Codnor-park in Heanor M L H
Cold-Eaton in (pt of) Ashburne W W
Cole-Aston in Dronfield S H
Combes-edge in Hope H P H
Compton in (pt of) Ashburne M L
Conksbury in (pt of) Yolgrave H P H
Coplowdale in Hope H P H
Cotes Park in Alfreton S H
Cotman-hay in Ilkeston M L H
Coton (in the Elms) in Lullington R G
Cowdale in Bakewell H P H
Cow-house Lane in Duffield Ap H
Cowley in (pt of) Darley in the Dale W W
Cowley in Dronfield S H
Cowlow in Hope H P H
Cow-way in Duffield A p H
pt of Coxbench in Duffield A p H
pt of Coxbench in Horsley M L H
Cressbrook in Tideswell H P H
pt of Cresswell in Elmton S H
pt of Cresswell in Whitwell S H
pt of Crich Town (and Parish) M L H (the rem. in S H and W W)
Crich-chase in (pt of) Crich M L H
pt of Cromford (Scarthen Nick) Matlock W W
pt of Cromford in (pt of) Wirksworth W W
Cromford Bridge, see *Wilarsley*
Crookstone in Hartington W W
Crope-top in Sutton on the Hill Ap H
Cross Green in (pt of) Darley in the Dale W W
Cross o' th' Hands in Duffield Ap H
Crowdycote in Hartington W W
Croxall Town (and Parish) R G H
Cubley Town (and Parish) Ap H
Cubley Moor in Cubley Ap H
Culland in Brailsford Ap H
Curbar in Bakewell H P H
Cutthorpe in Chesterfield S H
Dalbury Town (and Parish) Ap H

Dalbury Lees in Dalbury Ap H

Dale Abbey (Extra-parochial) Town (and Liberty) M L H

Dale-head in Tideswell HPH

Dale-moor in Dale Abbey M L H

Danes-moor, see *Ainmoor*

Dark-lane in (pt of) Crich M L H

Darley-Abbey in (pt of) St. Alkmund M L H

pt of Darley (in the Dale) Town (and Parish) H P H (the rem. in W W)

Darley-flash in (pt of) Darley in the Dale H P H

Darley-moor in Norbury Ap H

Darwent-chapel in Hathersage H P H

Deer-leap in North Winfield S H

Denby Town (and Parish) M L H

Derby Hills in (pt of) Castle Donnington R G

Derwent, see *Darwent Chapel*

pt of Derwent-dale in Hathersage H P H

pt of Derwent-dale in Hope H P H

Dethick in (pt of) Ashover W W

Dey-park in Duffield Ap H

Dinting in Glossop H P H

pt of Donisthorpe in Church Gresley R G H

pt of Donisthorpe in Measham R G H

pt of Donisthorpe in (pt of) Nether Seal R G H

Dore in Dronfield S H

Dove-hole in Hope H P H

Doveridge Town (and Parish) Ap H

Dowall in Hartington W W

Doway-hole Lane in (pt of) Ashover S H

Drakelow in Church Gresley R G H

Draycot in Sawley M L H

Dronfield Town (and Parish) S H

Long Duckmanton (cum Sutton) Town (and Parish) S H

Duffield Town (and Parish) Ap H

Duffield Bank in Duffield Ap H

pt of Dumshill in Dale Abbey M L H

pt of Dumshill in Ockbrook M L H

pt of Dumshill in Spondon Ap H

Dunston in Chesterfield S H

Eaglestor (or Eccles-tor) in (pt of) Yolgrave H P H

Eccles in Chapel-en-le-Frith H P H

Eccles in Hope H P H

Eckington Town (and Parish) S H

Edale Chapel, see *Grindsbrook*

Edensor Town (and Parish) H P H

Edge-moor in (pt of) Crich M L H

pt of Edingale in Croxall R G H (the rem. in Staffordshire)

Ediaston Town (and Parish) Ap H
Ednaston in Brailsford Ap H
EggingtonTown (and Parish) M L H
Elmton Town (and Parish) S H
Elton in (pt of) Yolgrave W W
Elvaston Town, (and Parish) M L H
Etwall Town (and Parish) Ap H
Eyam Town (and Parish) H P H
Fairfield in Hope H P H
Far-Duckmanton in Duckmanton S H
Far Lane in Staveley S H
Farley in (pt of) Darley in the Dale H P H
Farlow-green in Duffield Ap H
Farnah in Duffield Ap H
Fenny-Bentley Town (and Parish) W W
Ferneylee in Hope H P H
Findern in Mickleover M L H
Flagg in Bakewell H P H
Foolow in Eyam H P H
Ford in Chapel-en-le-Frith H P H
Ford in Eckington S H
Ford in North Winfield S H
Foremarke Town (and Parish) R G H
Foston in Scropton, Ap H
Four lane-ends (or Ufton) in South Winfield S H
Foxlow in Hartington W W
Fritchley, in (pt of) Crich M L H
Froggatt in Bakewell H P H
Gamesley in Glossop H P H
Gander-lane in Eckington S H
Gate-house in Hathersage H P H
Geer-lane in Eckington S H
Glapwell in Bolsover S H
Glass-house Common in Whittington S H
Glossop Town (and Parish) H P H
Glutton in Hartington W W
Goldcliff (or Goldy) in Hope H P H
pt of Golden-valley in Alfreton S H
pt of Golden-valley in Heanor M L H
Gotsey bank in (pt of) Wirksworth W W
pt of Goyte-bridge in Hartington W W
pt of Goyte-bridge in Hope H P H
Grange-field in Trusley Ap H
Grange-mill (Ivenbrook-Grange) in (pt of) Wirksworth W W
Gratton in (pt of) Yolgrave H P H
Grass-moor in Chesterfield S H
Great Hucklow in Hope H P H
Great Longsdon (or Longstone) in Bakewell H P H
Great-rocks in Tideswell H P H

Great Rowsley in Bakewell H P H
Great Wilne in Aston (upon Trent) M L H
Green-hill in Norton S H
Green-hill Lane in Alfreton S H
Greenwich in Pentrich MLH
pt of Griffe in (pt of) Bradburne W W
pt of Griffe in (pt of) Wirksworth W W
pt of Grindleford-bridge in Eyam H P H
pt of Grindleford-bridge in Hathersage H P H
Grindlow in Hope H P H
Grindon in Hartington W W
Grinds-brook (Edale Chapel) in Castleton H P H
Hackenthorp in Beighton S H
Hackney Lane in (pt of) Darley in the Dale H P H
Haddon Hall in Bakewell H P H
Hadfield in Glossop H P H
Hady in Chesterfield S H
Hales-green in Shirland S H
Hall-cliff in Chesterfield S H
Hall-field Gate in Shirland S H
Hanley in North Winfield SH
Hanson-grange in Thorpe W W
Hardwick-hall in Alt Hucknal S H
Hare Hill in Boylstone Ap H
Hargate-manour in Eggington M L H
Hargate-wall in Tideswell H P H
Harley in Hartington W W
Harstoft in Alt Hucknal S H
Harston in Matlock W W
Hartington Town (and Parish) W W
Hartle in Bakewell H P H
Harts-hay in Pentrich M L H
Hartshorn Town (and Parish) R G H
Harwood Grange in Bakewell H P H
Hasland in Chesterfield S H
Hasling-houses in Hartington W W
Hassop in Bakewell H P H
Hathersage Town (and Parish) H P H
Hatton in Marston on Dove Ap H
Hayfield in Glossop H P H
Hay-side in (pt of) Ashover SH
Hazlebadge in Hope H P H
Hazleford in Eyam H P H
Hazlewood-hall in Duffield Ap H
Hazlewood-lane in Duffield Ap H
Heage in Duffield Ap H
Heanor-wood in Heanor M L H
Heanor Town (and Parish) M L H
Heath Town (and Parish) SH
Heathcote in Hartington W W
pt of Heather Town (and Parish) R G H (the rem. in Leicestershire)

Heely-mill in Norton S H
Hempyard-lane in Norton SH
Hemsworth in Norton S H
Henmore in Denby M L H
Henmore in North Winfield S H
Higham in Shirland S H
High-Ash in Staveley S H
High-Ashes in (pt of) Ashover S H
High-lane in Eckington S H
High-low in Hope H P H
High Needham in Hartington W W
High-Oredish in (pt of) Ashover S H
High-street in Hartington W W
pt of Hill-cliff Lane in Duffield Ap H
pt of Hill-cliff Lane in (pt of) Wirksworth Ap H
Hillcote in Blackwell S H
Hill-Somersall in Somersall Herbert Ap H
Hilton in Marston on Dove Ap H
Hill-top in Bakewell H P H
Hill-top in Dronfield S H
Hognaston in (pt of) Ashburne W W
Holbrook in Duffield Ap H
pt of Hollington in Longford Ap H
pt of Hollington in Shirley Ap H
Hollinwood-common in Staveley S H
pt of Holloways (nether and upper) in (pt of) Ashover W W
pt of Holloways in (pt of) Crich M L H
Holme in Bakewell H P H
Holm-gate in North Winfield S H
Holmsfield in Dronfield S H
Holy-moor-side in Chesterfield S H
Hoon in Marston on Dove Ap H
Hope Town (and Parish) H P H
Hopping-hill (or mill) in Duffield Ap H
Hopton in (pt of) Wirksworth W W
Hopwell-hall in Sawley M L H
Horridge-end in Hope H P H
Horsley Town (and Parish) M L H
Horsley-gate in Dronfield S H
Horsley-Woodhouse in Horsley M L H
Houghton, Basset and Felley, see *Stoney H.*
Hulland in (pt of) Ashburne Ap H
Hulland Gate in (pt of) Ashburne Ap H
Hulland Lane in (pt of) Ashburne Ap H
Hulland Ward (extra parochial) Town and Liberty Ap H
Hungry Bentley see *Bentley*
Hundall (or Undall) in Dronfield S H
Hurdlow in Hartington W W
Ible in (pt of) Wirksworth W W
Iderich-hay in (pt of) Wirksworth Ap H

Ilkeston Town (and Parish) M I H
Ingleby in Foremarke R G H
Inkersall in Staveley S H
Inkersall-green in Staveley S H
Intake in Hulland-Ward Ap H
Ireton-wood in Kirk Ireton W W
Kedleston Town (and Parish) Ap H
Kelstedge in (pt of) Ashover S H
Kilburne in Horsley M L H
Killamarsh in Eckington S H
Kinder in Glossop H P H
Kings-Newton in Melborne R G H
Kings-Sterndale in Bakewell H P H
pt of Kirk-Hallam Town (and Parish) M L H (the rem. in Ap H)
Kirk Ireton Town (and Parish) W W
Kniveton Town (and Parish) W W
Langley (Kirk) Town (and Parish) M L H
Langley in Heanor M L H
pt of Langley-mill in Heanor M L H (the rem. in Nottinghamshire)
Langwith-lane in Scarcliff S H
Lea in (pt of) Ashover W W
Lea-hall in (pt of) Bradburne W W
Leam in Eyam H P H
Lea-wood in (pt of) Ashover W W
Lewcote-gate in West Hallam M L H
Lightwood in Norton S H
Lindow-lane in (pt of) Crich S H
Linton in Church Gresley R G H
Litchurch in St. Peter M L H
Little Chester in (pt of) St. Alkmund M L H
Little Eaton in (pt of) St. Alkmund M L H
Little Hallam in Ilkeston M L H
Little Hayfield in Glossop H P H
Little Hucklow in Hope H P H
Little Ireton in Kedleston Ap H
Little Longsdon (or Longston) in Bakewell H P H
Little-moor in (pt of) Ashover S H
Little Norton in Norton S H
Littleover in Mickleover M L H
Little Rowsley in (pt of) Darley in the Dale H P H
Little Wilne in Sawley M L H
Litton in Tideswell H P H
Loads in Chesterfield S H
Locko-Park in Spondon Ap H
Loco-lane in North Winfield S H
Long-Eaton in Sawley M L H
Longford Town (and Parish) Ap H
Long-Lane in Sutton on the Hill Ap H

Longston, see *Great* and *Little Longsdon*
Loscoe in Heanor M L H
Lower Birchett in Dronfield S H
Ludwell in Hartington W
Ludworth in Glossop H P H
Lullington Town (and Parish) R G H
Lumsdale in Matlock WW
Lydgate in Dronfield S H
Mackworth Town (and Parish) M L H
Makeney in Duffield Ap H
Malcalf in Chapel-en-le Frith H P H
Malham, see *Mytham-Bridge*
Mammerton in Longford Ap H
Mansel-park in Hulland Ward Ap H
Mapperley in (pt of) Kirk Hallam Ap H
Mappleton Town (and Parish) WW
Markeaton in Mackworth M L H
pt of Marple-bridge in Glossop H P H (the rem. in Cheshire)
Marsh-green in (pt of) Ashover S H
Marsh-lane in Eckington S H
Marston (on Dove) Town (and Parish) Ap H
Marston-Montgomery in Cubley Ap H
Matlock Town (and Parish) WW
Matlock Bank in Matlock WW
Matlock Baths in Matlock WW
Matlock Bridge in Matlock W W
Meadow in Tideswell H P H
Meadow-place in (pt of) Yolgrave H P H
Measham Town (and Parish) R G H
Melborne Town (and Parish) R G H
Mellor in Glossop H P H
Mercaston in (pt of) Mugginton Ap H
Meynel-Langley in Langley (Kirk) M L H
pt of Michael St. (pt of) Derby Town (and Parish) B of D (the rem. in M L H)
Mickleover Town (and Parish) M L H
Middle Duckmanton in Duckmanton S H
Middle Handley in Staveley S H
Middleton in (pt of) Wirksworth W W
Middleton in (pt of) Yolgrave WW
Midway-houses in Hartshorn R G H
Milford in Duffield Ap H
Mill-close Lane in Staveley S H
Miller's-green in (pt of) Wirksworth WW
Millington-green in (pt of) Wirksworth Ap H

Millthorpe in Dronfield S H
Mill-town in (pt of) Ashover S H
Miln-hay in Heanor M L H
Miln-hay in (pt of) Wirksworth Ap H
Milnhouse-dale (or Millersdale) in Tideswell H P H
Milton in Repton R G H
Monsal-dale in Bakewell H P H
Monyash in Bakewell H P H
Moor-hall in Staveley S H
Moor-hay in Chesterfield SH
Moor-hole in Eckington S H
Morley Town (and Parish) M L H
Morley-park in Duffield Ap H
Morton Town (and Parish) S H
Mosborough in Eckington S H
Mosborough-moor in Eckington S H
Mosscar-house in Hathersage H P H
pt of Moss-houses Hartington WW (the rem. in Cheshire)
pt of Mugginton Town (and Parish) Ap H (the rem. in M L H)
Mytham-bridge in Hathersage H P H
Nether Biggin in (pt of) Wirksworth Ap H
Nether-Birchwood in Alfreton S H
Nether Booth (Lady Booth) in Castleton H P H
Nether Bradburne in (pt of) Bradburne WW
Nether-end (of Heage) in Duffield Ap H
Nether Handley in Staveley S H
Nether Padley in Hathersage H P H
Netherthorp in Staveley S H
Nether Thurvaston in Sutton on the Hill Ap H
New Brampton (or Little Brampton) in Chesterfield SH
Newbold in Chesterfield SH
Newhall in Stapenhill R G H
New Haven in Hartington WW
Newmarket in North Winfield S H
New Mills in Glossop H PH
Newton in Blackwell SH
Newton-grange in (pt of) Ashburne W W
Newton Solney Town (and Parish) R G H
Norbrigs in Staveley S H
Norbury Town (and Parish) Ap H
Normanton (juxta Derby) in (pt of) St. Peter R G H
North-edge in (pt of) Ashover S H
North-Winfield Town (and Parish) S H
Northwood in (pt of) Darley in the Dale H P H

Norton Town (and Parish) S H
Norton-leys in Norton S H
Nuns-field in Trusley Ap H
Oaker-end in (pt of) Darley in the Dale WW
Oakerthorpe in South Winfield S H
Oaks in Norton S H
pt of Oakthorpe in Church Gresley R G H
pt of Oakthorpe in Measham R G H
pt of Oakthorpe in (pt of) Nether Seal R G H
Ockbrook Town (and Parish) M L H
Offcote in (pt of) Ashburne WW
Offerton in Hope H P H
Ogstone in Morton S H
Oler Brook in Castleton H P H
Olerenshaw in Chapel-en-le-Frith H P H
Ollerset in Glossop H P H
One-Ash in Bakewell H P H
Oneston (see *Unston*)
pt of Openwood-gate in Denby M L H
pt of Openwood-gate in Horsley M L H
Osleston in Sutton on the Hill Ap H
Osmaston in Brailsford Ap H
Osmaston in (pt of) St. Werburgh R G H
Ounston see *Unston*
Outseats in Alfreton S H
Over Biggin in (pt of) Wirksworth Ap H
Over Booth in Castleton H P H
Over-Birchwood in Alfreton S H
Over Hackney in (pt of) Darley in the Dale H P H
Over Haddon in Bakewell H P H
Over-Langwith Town (and Parish) S H
Overthorp in Eckington S H
Overton in (pt of) Ashover S H
Ox-close in Bakewell H P H
Oxcroft in Bolsover S H
pt of Packington in Willesley R G (the rem. in Leicestershire)
Padfield in Glossop H P H
Padley-hall in Pentrich M L H
Palterton in Scarcliff S H
Park-Hall in (pt of) Kirk Hallam Ap H
pt of Park Lane-head in (pt of) Crich M L H
pt of Park Lane-head in South Winfield S H
Parwich in (pt of) Ashburne WW
Peak Forest Extra-parochial Town (Chamber and Liberty) H P H
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## ERRATA IN THE FORMER LIST OF VILLAGES, &c.

The foregoing List (which was promised in the Note to p. 89 of the 1st volume,) has already appeared in another form, viz. arranged according to the Hundreds and the Parishes in each, within which these more particular Places are situate, vol. I. p. 78. On the spelling and arrangement of that List I bestowed much pains, in consulting various authorities and persons, Mr. Wolley of Matlock Bath, in particular, and in consequent and repeated alterations, and also in spelling and mentioning places conformable thereto throughout the 1st volume, in expectation that no further alterations therein would appear necessary: I am sorry however to find since the publication of the 1st volume, that Stidd Hall in Cubley should be erased, p. 78; that *Bubton* is omitted in Longford, p. 79; that (Hungry) should be inserted after Bentley, p. 79, l. 18; that, part of, should be inserted before Hollington, p. 79, l. 19; that *Mammerton* in Longford is omitted, p. 79; that, part of *Hollington*, and *Styd Hall* (or Stid) are omitted in Shirley, p. 79; that after Longsdon, (or Longston), should be inserted, p. 80, l. 4, and 12 from the bottom; that *Hill-top* is omitted in Bakewell, p. 80; that *Sparrow-pit* (Gate), p. 81, requires moving to Chapel-en-le-Frith from Hathersage, and *Perry-Foot* and *Rushop* to Peak Forest (Chamber) from Hathersage, p. 81 and 82; that *Foolow* is omitted in Eyam, p. 81; that Malham should be *Mytham-bridge* in Hathersage, p. 81.—The term Peak Forest, anciently included all the northern end of the county, but the particular district therein called the Chamber (*i. e.* Hunting Seat) in the Forest, now only bears that name, as an extra parochial place, and at p. 82, the word (Chamber) should be added, after the stroke that follows *Peak Forest*; that *Boulton*, p. 83, requires moving to St. Michael from Mickleover:—part of Donnington-park is omitted in Castle Donnington, p. 84:—After Packington should be added, (see Willesley), p. 84.—Before Ticknall should be inserted, part of, p. 85.: after Shuttlewood should be inserted (or Shittlewood) p. 86, l. 6.:—Walley should be *Whaley* in Bolsover, p. 86.—Brimmington should be *Brimington* in Chesterfield:—after Lindow-lane (or Lindway) should be inserted p. 86: —Oneston should be, *Unston* (Ounston or Oneston) in Dronfield.—Mossborough should be *Mosborough* in Eckington, p. 86, and *Mosborough-moor*, p. 87.—After Ainmoor should be inserted, (or Danesmoor), and Danesmoor should be erased, p. 87.—Woodhouse should be *Woodthorp* in North-Winfield, p. 87.—After Over Langwith, a stroke should be drawn for the Town, and, part of Stoney Houghton (or Houghton Basset) inserted in this parish, p. 87:—before Pinxton, part of, should be inserted, p. 87:—before Stoney Houghton in Plesley, part of, should be inserted, and

(or Houghton Felley), after it, p. 87; after Four-lane-ends should be inserted, (or Ufton), p. 87.:—Cinder should be Cinders, p. 88, l. 7; and Hasling House should be, Houses, p. 89, l. 5. At page 90, l. 13, it should be noted, that part of Pinxton parish is in Nottinghamshire. It should also be mentioned, p. 92, l. 2, that *Edensor* is wholly surrounded by Bakewell Parish.

In the List now given, *part of* (or *pt of*) prefixed to a place's name, signifies that the remainder of such Village, Hamlet, Township, or Town, is situate in some other Parish, Hundred or County, than is here specified: and when the names of Parishes that follow the places' names, have (*part of*, or *pt of*) prefixed, it is to denote, that such Parishes extend into some other Hundred, and County also in some instances, besides the Hundred in Derbyshire, which is specified: all which are noticed and explained, vol. I. p. 89, &c.

Throughout these volumes, where particular Farms or other Houses, or very local Places are referred to, as the sites of Mines, Pits, Quarries, or of any natural or artificial production, &c. &c. I have added the name of some place (the nearest generally) that will be found in this List, and in that at page 78 of vol. I.; and when there happens to be two places of one name herein, I have been careful to add further particulars to distinguish them: so that I may hope, that little if any uncertainty can remain, or difficulty be experienced, by strangers even, to identify or find out the very spots that I have referred to: and it may not be amiss to notice, that where person's names are mentioned, in connection with any of the numerous details in these volumes, that, the residence and its bearing from the nearest Post Town, of the persons mentioned, as Contributors, in the Preface to the first and to this volume, will often assist in tracing out any particular spot on a large Map, or in finding it, by those who are travelling.

I have again availed myself of the kindness of Mr. Adam Wolley, in sending the proof sheets of this alphabetical List to him at Matlock-Bath, for correction, and the like to Mr. James Dowland of Cuckney, so that I may hope, that it is now correct, except the omissions in page 3, of *Bubton* in Longford Ap H, and in p. 6 of pt of *Donnington-park* in Castle Donnington R G (the remainder in Leicestershire), unfortunately not discovered until that sheet was put to press; and since then I have learnt, that in 1812 an Act was obtained, for erecting the Town of *Buxton* (before in three parishes, as mentioned page 4) into a separate Parish: the new and elegant Church erected therein by the Duke of Devonshire, was consecrated and opened in August, 1812. On the *spelling* of some of the places' names, in my Lists, there will remain differences of opinion, according as present or ancient *use*, or *derivation*, is to prevail: the separate maintenance of the roads, and the poor, and marrying, christening and burying at the Chapels of Ease in some few of the Hamlets or Townships, and not in others, have occasioned doubts with some persons, as to my arrangements of these parishes; what is given herein, is, however, I am assured, from the most authentic sources.

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# AGRICULTURAL SURVEY

OF

# DERBYSHIRE.

## CHAP. II.

### STATE OF PROPERTY.

#### SECT. I.—ESTATES, AND THEIR MANAGEMENT.

THE Estates of this County, at one period since the Norman Conquest, appear to have been in very few hands; at present they are as much and as generally divided, as is usual perhaps in the northern English Counties. The Duke of Devonshire, and some few others, have still very extensive possessions, which they are increasing from time to time.

The *prices* at which Estates appear to have sold of late, is thirty years purchase on the Rentals, where of considerable magnitude. Near the larger Towns its price is said to be from 150*l*. to 300*l*. per acre: about Mackworth the selling price of Land was mentioned, as from 90*l*. to 150*l*.: at Kirk-Ireton I heard of 90*l*. being often given, and that some uninclosed newly-allotted Lands on their Common, sold a few years ago at 100*l*. per acre. Conygree Farm, on the edge of Eg-

gington Heath, of which it had recently received thirty acres as an allotment, sold for 80*l.* per acre, all through: at Hoon two Farms, on Red Marl and Gravel, were sold, a short time before I was in the County, at 70*l.* and at 80*l.* per acre, as I understood.

The *management* of Estates were principally entrusted, until of late years, either to Persons expressly employed as Agents, or to Land Surveyors, or others who had different rural concerns of their own and others to manage: but here, as is I fear too commonly the case in other Counties, the Salaries and Allowances made to Land-Stewards, were so small, that many of the Persons best qualified for such trusts, are reported to me, as having given them up; others were on the point of doing so; and that the management of the Land was rapidly falling into the hands of the Attornies of the District, who cannot in general be considered as properly qualified, for many of the essential duties of this important Office: to me it seems surprising, that any Gentleman of Landed Property should fail to discover, that where, for the sake of securing his own Law business, and that which can be made among his Tenants, a Gentleman of that Profession, is willing to undertake the care of his Estates, at a Salary greatly below what any Man of humbler, tho' not less important and useful pursuits, is disposed to accept, that the best Interests of himself and the Community are likely to suffer, in a much higher degree than his apparent savings amount to. That some Country Attornies, from their general knowledge of rural affairs, and their zeal for Agricultural Improvements, are thoroughly qualified for Land Stewards, I have the pleasure of knowing, as also, that these Men are averse to undertaking Agencies, unless all the Time necessarily

necessarily occupied in attending to them, is quite as well paid for, as to any part of their own Profession.

A very laudable spirit has prevailed among the Land-owners in Derbyshire, for employing Surveyors to Measure and Map their Estates, by which the statute acre, rood, and perch, is almost universally known and established; and excellent *Maps* are to be found, in the hands of the Gentlemen and their Agents and Surveyors, of by far the greater part of the County—a circumstance which I found of the utmost use, in my Mineral Survey, as will be seen in my acknowledgements to most of these last, in the Lists, in the Prefaces to the former and present Volumes. Where no entire Survey of a Parish or Hamlet has been made, it has been usual in numerous instances of late, to employ a Land Surveyor to measure and value the whole of it, for fairly and accurately adjusting the Poor's Rates, and other Parochial Taxes: the justice and advantages of which, claims its more general adoption, particularly in the Towns and considerable Villages; where often the Rates, particularly between the Land and House occupiers, are far more unequal, than where there is but one class of occupiers.

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## SECT. II.—TENURES.

*Freeholds* almost generally prevail thro' Derbyshire, and the quantity of *Copyholds*, or of Lands held under *Church Leases*, is very inconsiderable, I believe: In the Act for Inclosing Matlock in 1780, it seemed to me rather a singular provision, that all encroachments from the Commons, of twenty years standing or upwards, were to become Copyhold, and their

fixed Rents to be ascertained by the Commissioners: this I afterwards learnt, was principally intended, for securing the extensive Premises which had been erected on the waste, at Matlock Bath, to the Persons who erected them.

CHAP.

# CHAP. III.

## BUILDINGS.

### SECT. I.—HOUSES OF PROPRIETORS.

DERBYSHIRE contains several very spacious and superb Mansions of the ancient Families, and a very great number of pleasantly situate and elegant Houses of the Gentlemen of Landed Property, and belonging to opulent Manufacturers; most of which, are sheltered and ornamented by Plantations more or less extensive, and are accommodated by excellent Gardens, and as neatly-dressed Paddocks and Grounds, as are to be found in almost any County in England, except Middlesex and those others near the Metropolis. Amidst so much taste and spirit, as I witnessed, when partaking of the hospitality generally prevalent in these Houses, it would be almost invidious in me, to particularize instances, had I prepared myself with notes for the purpose, but which I certainly did not do, finding always ample subjects in the rural improvements of the place, and natural objects and beauties of the vicinity, to occupy fully my attention. A few miscellaneous particulars which I noted, as applicable to Gentlemen's residences, will perhaps be introduced with less impropriety here, than any other part of this Report.

Stone, as may be supposed from the prevalence of this valuable article (see the 1st Volume) is principally employed in the Houses of the County, except in the

Red Marl District, where Brick Buildings most prevail; and it was remarked to me, that when the walls and floors are of Limestone, they often prove damp, at times, when those of Grit-stone show no signs of moisture.

I saw two or three instances of *dry-rot* in the County, one of which, in an Outhouse in the Garden of Bache Thornhill, Esq. at Stanton in the Peak, showed the fallacy of an opinion often advanced, that confined or stagnant air, is *essential* to the production of this evil; it was a sash-frame, opening inwards, and almost constantly standing open, which was nearly destroyed by that pestilential fungus, the Dry-rot Boletus (*Boletus lachrymans*), that occasions this mischief: I have noticed many similar instances, in wood constantly exposed to the open air: see an account of Dry Rot in Mr. Benjamin Chambers' Barn Floors at Tibshelf, in Mr. Robert Lowe's Nottinghamshire Report, page 10.

At Newton Solney I noticed a good House, belonging to Abraham Hoskins, Esq. very tastefully and well finished with Parker's Roman Cement, executed by Francis Bernasconie. I beg to mention here, that a very superior article of this kind, to that usually made from the Clay-balls of the London Clay stratum, as mentioned Vol. I. p. 3, has been made on Lord Mulgrave's Estate in Yorkshire, since that Volume was put to press, and may be had at the Roman Cement Wharf in Pedlar's Acre, Lambeth.

In several Gardens, I saw Grottos, fitted up, with the double view of affording a cool retreat in hot weather, or from a shower, and of preserving and showing to strangers, large specimens of the most noted Minerals of the district, viz. in Chatsworth Gardens (executed by Mr. White Watson); in Calke Gardens, a new

new one (by Mr. Samuel Brown), and an ancient one; at the late William Longsdon, Esq. at Eyam; at Abraham Hoskins, Esq. at Newton Solney, &c.

At Ashover, Mr. William Milnes has had a chimney-piece executed, at my suggestion, which shows in its Frieze or Mantle, an inlaid Tablet of the several Rocks, each of its own proper stone, and in their natural order and position, as they occur in a section across the middle of that interesting Parish; which was executed by Mr. White Watson of Bakewell, and forms a pleasing object, and subject of contemplation, well worthy of imitation in other places.

Among the many conveniences in and about the Houses, in and near Derbyshire, which were in some degree new to me, I noticed, at Norris Hill, on Ashby Wolds, Leicestershire, most complete Steam Cooking, Roasting, and other Culinary Apparatus, erected by Mr. John Bawford of St. Werburgh in Derby, in the House of Henry Smith, Esq. Small water-wheels, worked by the water, either from a small lead pipe and cock, or a small stream of water, are used for turning the Spits in the Kitchens, at Chatsworth House; at the Ram's-head Inn at Disley, Cheshire; and at the Grove and at the Old Hall Inns, at Buxton.

The Laundry at Bradby Hall in Bretby, appeared to me an excellent one: and connected with this subject it may be useful to mention, that in Stapenhill, Stanton Ward, &c. it is common to have in their Gardens, Boxes on the tops of Posts, each with a roof to shoot off the rain, that contain a roll, turned by a handle outside, on which Hair Lines are wound and constantly kept, for drying of Clothes, when unrolled and stretched to another Post: which seems a preferable mode of preserving them, to taking down the Lines and stowing

 them

them away, perhaps in a damp state, in places where they contract dirt, and are often to seek, when wanted. The House-wives of several parts of Derbyshire, use, I observe, the Italian Irons, for the Frills of Shirts, Caps, &c. supported on a stand, and heated from time to time, by iron heaters, put within the hollow of the Iron.

At several Houses in Derbyshire I saw foot-lathe Wheels, on a simple construction, turning spindles, on which wooden wheels dressed with emery were used, for cleaning Table Knives, in a very effectual and expeditious manner; and it struck me, that brushes on the same spindles for cleaning of Boots and Shoes, would be found equally useful.

At Mr. Moore's in Lullington, I saw a useful Rack for hanging up Boots, in his Kitchen, with their tops downwards, to prevent dust settling in them, and their being put out of shape by hanging up by one strap, as usually happens in Boot-closets; a stick was always ready to put up into a Boot to lift it off the Pins, between which it hung, in sight, so that it could always be seen that the Boots were clean and in order; a matter of some importance, to a Gentleman who has frequently to go out and come in, in wet weather.

The Architects which I met with, resident in Derbyshire, were, Mr. Samuel Brown of St. Peter's Derby, Mr. William Martin of Bretby, and Mr. Thomas Sykes of Chesterfield.

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## SECT. II.—FARM-HOUSES AND OFFICES.

The number of Large Farms, or of large and spacious Farm-Houses and Premises in Derbyshire, is not great, compared with some other Counties: its Farm

Houses

Houses and Offices will in general however be found, as good and convenient, as in most other Counties. A few of the Farm Premises that I noted, in the course of my Survey, as seeming deserving of particular attention, are mentioned below in the order of the Places, and respecting most of which, I shall have other particulars to state, in the Sections which treat on the particular subjects of the different parts of these establishments.

At Barton-Blount, Francis Bradshaw, Esq. has an excellent Farming Establishment: he was unfortunately from home when I called, or I should probably have had more to quote concerning it.

At Boylstone, Mr. Robert Stone has recently erected a very complete set of Farm Premises, of Brick covered with slate.

At Bretby or Bradby, the Earl of Chesterfield has in his Park, one of the most complete Farming Establishments in all this part of England, perhaps. The Buildings are of hewn Stone, obtained near the spot, in Red Marl, slated, and they are neatly pointed out, with Breedon Lime mixed with Coal-Ashes, that gives the whole a very pretty effect. By the kindness of his Lordship, and of Mr. William Martin his Architect and Builder, I have been enabled to present a Plan and Elevation of them, and their descriptions.

*Plate* I. facing page 10, contains a general Plan, and the Elevations of the principal Buildings, which are on the north and on the south sides of the Yards. The following references to the general Plan, will explain the arrangement and uses of the several parts, viz.

A. *Dairy*

### *Dairy Court.*

A, The Bailiff's Kitchen.
B, Pantry.
C, Store Room.
D, Parlour.
E, Dairy Parlour.
F, Cream Dairy.
G, Cheese Dairy.
H, Dairy Scullery.
I, Salting House.
K, Water-Closet.
L, Pump Yard.
M, Coal Yard.
N, Boiling House.

### *Inner Poulterer's Yard.*

O, Poulterer's Shop.
P, P, &c. Feeding Houses.
Q, Roosting House.
R, Laying and Sitting House.

### *Outer Poulterer's Yard.*

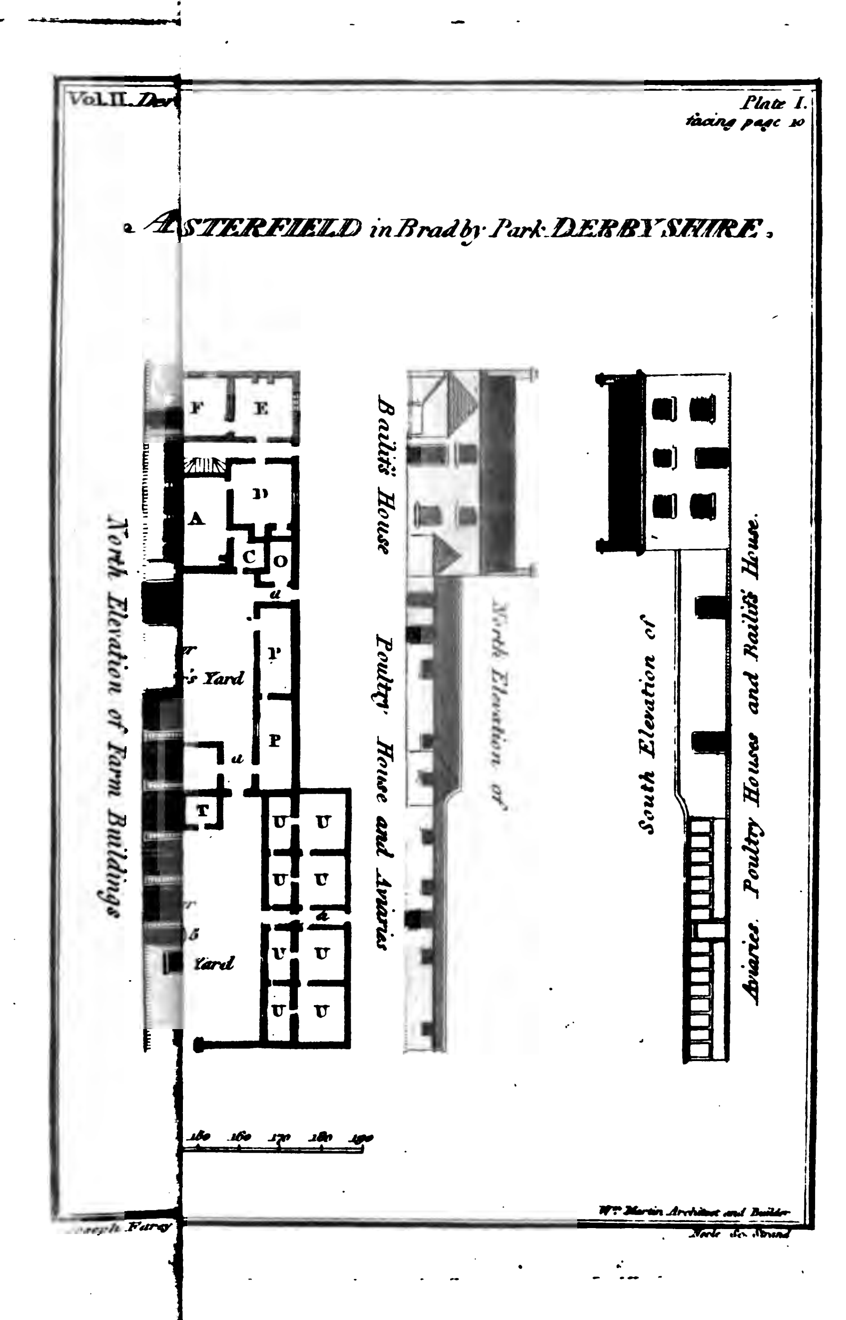
S, Pond.
T, T, &c. Poultry and Store Sheds.
U, U, &c. Aviary for Pheasants.
a, a, a, &c. Passages.

### *Farm Yard.*

No. 1, 1, &c. Piggery.
2, Pig Cistern.
3, Water Cistern.
4, Stable.
5, Hay Bin.
6, Open Shed.
7, Entrance, from the west.
8, 8, Cow Houses.
9, Calf House.
10, Hay Bin.
11, House for sick Cattle.
12, Bull Stalls.
13, Stairs to the Granary, Cheese Chamber, &c.
14, Straw House.
15, Chaff House.
16, Barn.
No. 17, Porch to Barn, with Pigeon-House and Clock above.
18, Thrashing Mill.
19, Dressing Flour, Corn Bins, and Granary above.
20, Mill Race, or Horse-track.
21, Cart House, with Granary above.
22, House for Implements, and Wool Chamber above.
23, Turnip House, and Hay-chamber above.
24, Cottage for a Farm Labourer.
25, Main drain, leading to a Reservoir for Urine, &c.

Several of these will be spoken of more particularly, in the future Chapters of this Report.

At



Vol.II. Der
Plate I.
facing page 10
ASTERFIELD in Bradby Park DERBYSHIRE.
F
E
D
A
C
O
P
P
T
U
's Yard
Yard
North Elevation of Farm Buildings
Bailiff's House
Poultry House and Aviaries
North Elevation of
South Elevation of
Aviaries. Poultry Houses and Bailiff's House.
150 160 170 180 190
Joseph Farey
Wm. Martin Architect and Builder
Neele sc. Strand

At Chaddesden, Sir Robert Wilmot, Bart. has excellent Farm Premises.

At Locko-Park, William Drury Lowe, Esq. has a most complete Farm-Yard; the Buildings are of Brick, and the corners of the Walls, arches of the Windows, &c. are formed of bricks with rounded corners, made on purpose, which seem very durable, and scarcely liable to accidents.

At Mugginton, S of the Town, is a Farm House and Premises, near Wild-Park, called Nether Field, which I mention here, from conceiving them to be those, of which a description and Plan is given at p. 43, of the original 4to. Report: tho' I was unacquainted with the circumstance when I passed this Farm, having failed in obtaining information from numbers, of whom I made enquiry when in the County, as to which was the Farm that Mr. Brown describes: since my return I wrote to Mr. B. and from his answer I conclude, tho' not with certainty, that this must be the Farm intended.

Near Newhaven House in Hartington, a complete Farm-Yard and Cottage was erected, of Stone, a few years ago, by the Duke of Devonshire, on Mr. Timothy Greenwood's Farm, attached to the Newhaven Inn.

At Newton-Solney, Abraham Hoskins, Esq. has lately completed a most convenient and elegant suit of Farm Premises: on which no cost has been spared, to render them most convenient and complete.

Near Pilsbury in Hartington, the Duke of Devonshire a few years ago erected, under the direction of Mr. Joseph Gould, his Tenant to a large new Allotment of the Common, a very complete set of Farm Premises and Cottages, as an appendage to his Pilsbury Farm.

Over

Over about two-thirds of the County of Derby, Limestone or Grit-stone Buildings almost universally prevail; the *Walls* being very substantially built, and gable-ends, with chimnies in the end walls, being nearly general: in the Red Marl and Gravelly districts at the south end of the County, and in the Coal-district there, and in part of that near the eastern side of the County, Bricks are generally used in the walls; red, and of a pretty durable kind. The Union Inn and several of the Buildings at Measham, erected by that spirited improver the late Joseph Wilkes, Esq. are made of Bricks, almost double the size of common Brick: while on the other hand, George Strutt, Esq. of Belper, prefers and makes Bricks so much smaller than usual, as to construct seven-inch walls to his Cottages, and in the partitions, &c. of his works.

On the south and south-east of Ashburne, I noticed some very large old Barns, built of Bricks, with numerous holes left in the walls for air to the Corn, and which at the same time let in Birds and Vermin very freely, I should expect. In Stapenhill, I saw a few Timber and brick-nogged Buildings, and in Norbury a few old ones, almost entirely composed of vertical beams of Oak Timber: modes of Building, which ought perhaps, in the present state of these Islands, when the greater part of the surface should be appropriated to raising food for our increasing population, to be entirely abolished, and Stone, Brick, or Pisé Earth* walls, universally adopted in Buildings.

* See the process, expense, &c. of constructing this useful kind of Earthen Walls, described by Mr. Robert Salmon in the Transactions of the Society of Arts, Vol. xxvii. p. 185, according to methods highly improved, since those which the late Mr. Henry Holland communicated to the Board, and were printed in its Communications, Vol. I.

A very

A very commendable neatness prevails thro' a great part of the Houses and Cottages in Derbyshire, in painting and whitewashing the walls, for which the Peak Lime is excellently adapted, as observed in Vol. I. p. 308; and in Rough-casting and colouring in other situations: at Culland, Mr. William Cox shewed me some very hard and durable rough-casting, done with four parts of washed river Sand and one of Wild-Park Lime, well sifted and incorporated while dry.

Very neat hammer-dressed and coursed Stone-fence Walls are in use for the Gardens, &c. at Belper, Cromford, and other places.

The *Roofs* of the Buildings in Derbyshire seem sharper pitched, or more acute at the Ridge, than is usual in the south of England, particularly, in perhaps one-third of their whole number, which are covered with the grey and white Slates or Tile-stones of the district: in the large Town of Sheffield, near this County, this white slating is universal, and gives the Town a singular appearance on approaching it, in several directions: on their roofs, Ridge or Rig-stones (Vol. I. p. 431) are frequently used instead of Ridge Tiles*. The Red Tiles made in Derbyshire, perhaps for want of washing and more perfectly tempering their Clays, are found less durable, as well as thought less handsome by many, than a sort of black or very dark blue dull glazed Tiles, almost the colour of new cast Iron, which are brought out of the Pottery district of Staffordshire, as has been mentioned in Vol. I. p. 453, and are pretty extensively used, in the southern part of the County.

* About Belfast in Ireland, cast Iron Ridging is common, and might perhaps be introduced here with advantage, instead of Ridge Tiles, or Ridging Stones.

I saw but one remaining instance, of the *Shingles* of cleaved Oak, or wooden Tiles, which probably was once much more common, and that was on the Church at Walton on Trent: this method of covering Buildings, Churches in particular, still continues in Sussex, Kent, Essex, and some other Counties, to waste some of the very best of our Oak Timber, and ought to be speedily discontinued.

No considerable quantity of the Straw of Derbyshire, is, fortunately, diverted from the more important purposes of litter and manure, to cover permanent Buildings; and the few Thatched Farm Houses and Cottages which are still found, ought to give place to Tiles, or Tile-stone coverings. The straw which is used in Thatching, is generally, *drawn* or trust wheat straw, and is often carried considerable distances to the sides of brooks or ponds, for the purpose of wetting it, and preparing the Thatch-sheaves or Yelmes; by which it appeared to me, that there is a considerable waste of labour and straw. In the northern parts of the County it is common, when Thatch is used, to lay it on a course of strong Eaves-slates or Tile-stones (mentioned Vol. I. p. 431), which prevent the Cattle from pulling the Thatch off low Buildings surrounding a yard, or against a field; and ladders, &c. occasionally placed against such Buildings, do less damage than to thatch Eaves; and about Mansfield, Notts, such Eaves-slates are used to Tiled Buildings with the same view. *Landers* or Water-troughs at the Eaves of Houses and Buildings, are often now in this district, hollowed out of half a fir Pole, instead of using the arras troughs which are generally made, and are found to leak and to decay, much sooner than these solid ones, which I first saw at Mr. Joseph Gould's new Farm near Pilsbury:

bury: in some few places these Landers are made of Tin and Iron plate and in others of thin Cast Iron (as at Belfast in Ireland). Another contrivance worth mentioning, is, the manner of conducting the water down from an Eaves-trough or Lander, which is very common about Mansfield, on the edge of Nottinghamshire; it consists, in suspending a slight wooden rod from the end of the Lander, hanging down into the Water-Butt or Cistern, down which the water runs, without being scattered by the wind, or blown against the wall, as too constantly happens, unless expensive upright spouts or trunks are used, to convey the water down, and which are very subject to decay.

The ground *Floors* of Cottages, Farm Houses and Offices, are commonly laid with Flags or Paving-stones, in the northern parts of the County, and with Bricks or Plaster in the southern parts, which last kind of floors, are frequently also used for the Attics of good Houses, as at Bradby-Hall and others, as a security against fire.

About Brassington, the smallest waste Spar from their mine-hillocks, is mixed with a small proportion of quick-lime, tempered together with water, and spread on a floor, and beat down with a flat board once or twice for the first ten days, to prevent its cracking: a good sized Plaster Floor prepared in this way, costs only about 10*s*., I was told.

Calamine Sand, or the refuse of its Ore, ground together with Lead Slag, as is done in the rollers at Via-Gellia Cupola in Bonsal dale, is an excellent composition for Plaster floors.

The Sulphur from the Chimnies of the Lead Cupolas in small quantities, and sometimes a little Blood, is mixed

mixed with the small and refuse Lime at the Kilns, about Matlock, for preparing Plaster Floors.

About Alfreton, the smallest Minion, or refuse siftings of the roasted Iron Ore at the Furnaces (Vol. I. p.401), is mixed in equal proportions with the Sutton or Magnesian Lime, for preparing Plaster Floors, which are beat much during their drying, and then become in time so hard, as to strike fire with steel, I have been told.

But more commonly, the inferior sorts of Gypsum are used, for preparing these Plaster Floors (as mentioned Vol. I. p. 150 and 151); the plaster of old floors being burnt, and mixed with fresh Gypsum, with good effect, in preparing new ones. About Bretby the cost of these floors is about *3s. 3d.* per square yard, or *2s. 9d.* where the wood is furnished to the Mason for burning the plaster. The process of burning and preparing Plaster for floors in the neighbourhood of Burton on Trent, where I saw the operation in the Town Street of Stretton, Staff. is the most wasteful that can be imagined: an immense pile of brush and billet wood was made, and upon it the old plaster and some new, from Horninglow Marl-pit, was laid, and fired: after which, a number of Men with flails, thrashed, and rather wasted and spread it about than pulverized it. Kilns have lately been erected on the banks of the Derby Canal, for calcining and preparing Gypsum of the inferior kinds, for Sale, (as mentioned Vol. I. p. 150), and doubtless such must come cheaper for making floors, than it can thus be prepared, by open fires and thrashing.

Before I quit the subject of House Floors, it will be right to notice the arched fire-proof Buildings of

Messrs.

Messrs. Strutts at Belper, at Milford and at Derby; wherein small pottery hollow Cylinders, or Cones (prepared at Smalley Common Pottery, I. p. 450) are used for arching all the cielings, and on which plaster, brick or stone floors are laid. These Gentlemen kindly permitted my Sons to take minute plans and drawings of their various improvements, among which, this method of fire-proof Building, will be published, on some future occasion.

I come now to a subject, deeply interesting to the Proprietors and Occupiers of Land, and considerably so to the Country, I mean that of *Barn Floors*, in the great expence with which they are attended, and in the large consumption of the best Oak Plank, which they occasion, throughout a great part of England: which I see no reason to doubt, but Thrashing-Mills and Floors of Plaster, Brick and Stone, may in time, entirely obviate. A mode of close imbedding the Sleepers of Oak Floors in Masonry, and laying the Planks on fresh lime grout, is mentioned in the original Report (p. 52) as very favourable to the duration of the Floors, and the same is confirmed by a communication from Mr. Benjamin Chambers of Tibshelf, printed in Mr. Robert Lowe's Nottinghamshire Report, page 10. I am happy however to find, that since these periods, the attention has been turned, to changing the system altogether. About Brailsford, some Plaster Floors have been tried, but are not so well approved of, for Thrashing upon, as those made of a sort of long thick Bricks, of a blue colour, fetched from Cheadle in Staffordshire, which Bricks are, I believe, much used in Warwickshire, for Barn Floors. At Broad-field Farm in Croxall, Mr. John Garman has two Brick Floors, laid with Paving Bricks on edge, made at Glass-gate Heath near

 Tamworth,

Tamworth, Warwickshire: at Edingale Mr. William Pimm has a similar Brick Thrashing Floor; and at Lullington Mr. Thomas Moore has two similar Brick Floors in use.

About Clay-cross, North Winfield, &c. several Barn Floors are laid with a kind of Cank Paviers dug at Clay-cross (Vol. I. p. 441), too hard to be squared, but are chose out to match the rhomboidal fragments, into which it naturally breaks. In Denby, similar hard rhomboidal Canks, dug ¼ *m.* S E of the Church, are used in paving Thrashing Floors. At Beeley, Great Rowsley, &c. Paviers are used in Barn Floors, which are dug on Beeley Moor. About Morley, Horsley, &c. many Thrashing Floors are laid with hewn paving-stone five inches thick, prepared at Morley Moor Quarry, and which are laid at 4*s.* 6*d.* per yard super. the Farmer doing the carriage.

In Hartington, Mr. Thomas Fogg has a Barn Floor laid with Limestone Paviers.

At Oxcroft, Paving-stone of the Magnesian Lime, from Bakestone-Moor in Whitwell, is used for Thrashing Floors. At Bolsover, the Rev. Edward Otter has a Limestone Thrashing Floor, raised a foot above the Earth around; which, tho' it answers well in fine weather, in very wet seasons, it contracts a dampness to the sample of wheat thrashed on it, that depreciates its value as much perhaps as 2*s.* 6*d.* per quarter: as I heard no similar complaint from those who use stone floors, I suspect, that either the nature of the stone (which I had not the opportunity of examining) or of the ground it lies on, may occasion this extraordinary dampness.

At Ilkeston, Mr. Samuel Cocker has a floor, laid with blue lias Limestone from Barrow on Soar, which answers well. At Persal Pits Farm in Croxall, Mr. William

William Garman has three Floors, laid with Barrow Limestone many years ago, and which answer well, and shew not the least symptom of dampness, except in the very dampest weather at the going away of a frost. At Haunton, near Edingale, Staffordshire, Mr. Edward Barker has a Limestone Floor, laid with blue lias brought from Priors Cleave, N E of Evesham in Worcestershire. About Hull in Yorkshire, the Thrashing Floors of the Farmers are, as I am informed, very generally laid with Grit-stone Paving, of the 4th Rock, from Ealand-Edge and Cromel-Bottom Quarries (see Vol. I. p. 164).

Mr. Joseph Butler of Killamarsh, shewed me a method of providing, in the building of Brick or Stone Walls or Partitions, for driving Pegs to support Shelves, or for hanging heavy things upon: which consisted in working several hollow Cylinders of Iron Plate, into the wall at different heights, where Pegs were likely to be wanted; into which holes the Pegs are driven, and those not so wanted are stopped with Mortar.

About the year 1778 Cast-Iron Ovens began to be made at the Griffin Foundry, now Messrs. Ebenezer Smith and Co., and to be set by the sides of the Grates at the Public Houses and some Farm Houses, so as to be heated by the Fire in the Grate, when a small damper in the flue is drawn; and about ten years after, square iron Boilers with lids were introduced, to be set at the end of a fire Grate; and these have spread so amazingly, that there is scarcely a house without these Ovens, even of the Cottages of the first class; and most of the Public Houses and many others have an Oven on one side of the Grate, and a Boiler on the other; some Boilers being furnished with a Cock, and

others without; so that a hot closet and hot water, are always ready: sometimes the Ovens are so set as to be heated by a small stove under them, as I saw about Ashburne. At Matlock I heard, that where copper Tea Kettles are much subject to fur, or scurf, with calcareous matter, Potatoes occasionally boiled in them, removed the same.

## SECT. III.—REPAIRS.

The Buildings throughout Derbyshire, are generally kept in a respectable state of Repair, and as large a portion of this is done by the Tenants, probably, as in most Counties in England. The Cottagers, in many places, make a point of white-washing the insides of their Houses annually; in Ashover and other places, they always do this previous to their Feast or Wake.

## SECT. IV.—PRICES OF BUILDING MATERIALS, AND ARTISANS' LABOUR.

Under this head I have very little to offer, except making references to the list and prices of Building-stone, Freestone or Ashler and Coping-stones for Walls, given in Vol. I. p. 423; of Slate or Tile-stones, I. p. 430; of Eaves-Slates and Ridging-stones, I. p. 430; and of Paving-stones, Flags, or Paviers, I. p. 426, at several of the Quarries, where these different articles are dug and prepared.

From which Lists it will be seen, that the essential article of Stone for Building, is very generally distri-

buted;

buted; and from the List of Brick and Tile Kilns, Vol. I. p. 445 and 451; of Limestone Quarries, I. 408; and of the Kilns and the prices of Lime in Sect. 3 of Chap. XII. herein, it will be seen, how favourably this County is circumstanced, as to these essential necessaries, for Building and Repairing of Premises.

To give a satisfactory or useful view of the prices of Artificers' work, would, as I foresaw, require so many details, both as to kinds of work and situations, that on consulting several intelligent friends, I determined to lay this out of my consideration, in favour of more obtainable and not less important objects of enquiry.

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## SECT. V.—COTTAGES.

The Cottagers throughout Derbyshire, are much better provided with habitations than they commonly are in the Southern Counties of England, and they generally keep them more neat and in better order, I think: the vast numbers of neat and comfortable Cottages which have been erected, by the late Sir Richard and by the present Mr. Richard Arkwright, by Messrs. Strutts, Mr. Samuel Oldknow, and numerous others of the Cotton-spinners and Manufacturers, for the accommodation of their multitudes of work-people, must have had a great influence on the general style and condition, now observable in the Cottages: nor has the Earl of Chesterfield and many other Noblemen and Land-owners, been behind in their laudable pains, to furnish this most important accommodation for the labouring Poor; and their Rents are in general moderate, and adapted to the earnings and conditions of the Occupants.

In examining a County where so many well contrived and comfortable Cottages are found, in almost all situations and circumstances, I have seen no motive for enquiring for Plans or Estimates of Expence, as with many of my brother Reporters in other Counties has been the case, where the meritorious beginnings of some few Individuals, may require to be held up for more general imitation.

On the south-west of Buxton, a considerable number of Persons, and some of them I fear not of the most virtuous characters, have been permitted to burrow into and excavate themselves Huts, in the heaps of Lime-ashes or refuse of the numerous Lime-kilns there*, in subterranean abodes, something like those in the Gravel Rock at the N end of Nottingham Town, and at the S E end of Mansfield Town, &c.

## SECT. VI.—BRIDGES.

Over the Rivers in Derbyshire, there are several modern, convenient and elegant stone Bridges, viz. Hartington Bridge near Sawley, and Cavendish Bridge near Shardlow, over the Trent, built at the expence of the Devonshire Family for the accommodation of the public, on paying certain Tolls; St. Mary's Bridge in St. Alkmund, Derby, built in 1788; Milford Bridge, built in 1790 by Messrs. Strutts; Belper Bridge, 1795; Toad-moor, 1792, by Mr. Francis Hurt; Watstan-well, 1795; and Chatsworth two Bridges, by the Duke of

* It is said that 200 persons or more inhabit these Huts, by a writer in the Monthly Magazine, vol. 30, p. 211.

of Devonshire: these seven are over the Derwent; Monks Bridge over the Dove near Eggington; and Mellor Mills, by Mr. Oldknow, over the Goyte. At Swarkestone and Burton there are very ancient and long stone Bridges over the Trent and its flat meadows, and various streams. Over the Derwent, besides the above, there are stone Bridges, most of them very old ones: at Duffield, widened in 1803; Cromford, widened a few years ago; Matlock, widened a few years ago; Darley, Great Rowsley, Baslow, Calver two, Stoke, Grindleford, Hazleford, Mytham (or Malham), Yorkshire near Bamford, &c. Over the Rother there are stone Bridges, at Beighton, Killamarsh, Renishaw, &c. Over the Ethrow, at Copstall near Ludworth, Broad-bottom near Charlesworth, Hague near Gamesley, &c. Over the Goyte, at Marple, Windy-bottom near Mellor, Hagne-Fold two, near New Mills, &c. Over the Dove there are stone Bridges, at Tutbury near Hatton, Sudbury, Doveridge, Norbury, Hanging-Bridge near Ashburne, Mappleton, Cow-wall near Thorpe, &c. The greater part of which are maintained, as they were built, many of them, out of the County Rates, see Sect. 5 of the next Chapter.

Several of the above Bridges consist of only one arch of considerable span, as at Mappleton, on the south side of Chatsworth Park, at Mellor Mills 54 feet span, Broad-bottom Bridge 63 feet span; and Sir Henry Crewe is at this time erecting an arch in his Park at Calke, partly for ornament and partly for use, under the direction of Mr. Samuel Brown his Architect, which spans 119 feet! The Aqueduct Bridges and the Ferries, will be noticed in Section 3 of Chapter XVI.

There are five Bridges at which Foot Passengers

pay a Toll, viz. Hartington on the Trent, at Little Wilne Mills, wooden Horse and Foot Bridge, at Milford, at Toadmoor Bridge, and at Alderwasley Forge, a wooden Bridge belonging to Francis Hurt, Esq. over the Derwent.

CHAP.

# CHAP. IV.

## OCCUPATION OF THE LANDS.

### SECT. I.—SIZE OF FARMS.

THE number of Farms in Derbyshire of considerable size, is small, and there are none that can with propriety be called *large* Farms: the following are among the largest which I heard of, viz.

Burrow-Fields in Walton on Trent, Mr. Robert Lea, 441 acres.
Church Sterndale in Hartington (Briarley-foot), Mr. ——, 500 acres.
Croxall, Thomas Prinsep, Esq.
Drakelow, Grove Farm, in Church Gresley, Mr. William Hill.
Foremarke, Mr. John Pearsal.
Foremarke-Common, Mr. Joseph Spur.
Foremark-Park, near Cadhouse-Lane, Mr. William Smith, 402 acres.
Lullington, Mr. Thomas Moore, 603 acres.
New-Haven, in Hartington, Mr. Timothy Greenwood, near 600 acres.
Newton-Solney, Abraham Hoskins, Esq.
Pilsbury, in Hartington, Mr. Joseph Gould.
Stanton Ward, the late Fletcher Bulliyant, Esq.

The above don't of course include the Duke of Devonshire's Tenants, in the Woodlands of Hope, who have

have such large tracts of mountain Bogs and heathy uncultivated Hills attached to their Farms, otherwise rather small ones. All the Farms in the above list, except those recently laid out (on the 4th Lime Rock) at Church-Sterndale, New-Haven and Pilsbury, are upon the Red Marl, or the gravelly coverings to the same, except perhaps, some parts of Mr. Bullivant's and Mr. Smith's Farms, which may touch on the Coal-measures.

In Ashover it is computed, that the Farms average under 50 acres: Sir Joseph Banks has, for a Rental of 1613*l*., no less than 97 Tenants in that Parish: and such small occupancies are by no means uncommon, in other places.

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SECT. II.—FARMERS.

I HAVE no hesitation in saying, that the Farmers of Derbyshire appear to me, to rank higher in intelligence and spirit for improving the Lands they occupy, than those of some Southern Counties with which I am best acquainted; and that nothing but Leases and larger Occupations are wanting, to soon make this, one of the most improved Counties in England. The small occupiers of Land here, have generally some other business to engage their attention, connected with Trade, Manufactures, Mines or Collieries, but not being those listless and uninformed characters, which prevail in too many agricultural districts, they appear to me, to bestow quite as much thought and as much attention to their Lands, as the mere Farmers of the same class, in some other Counties do: and considerably to disprove the assertion, often made, that Manufacturers, Trades-

men,

men, &c. make bad Farmers: since certain it is, that many, largely engaged in these pursuits, like Mr. Samuel Oldknow of Mellor, Mr. Ellis Needham of Hargate-wall, Mr. George Strutt of Belper, Messrs. Milnes of Ashover, &c. &c. may rank among distinguished agricultural Improvers. Nothing can be further from the truth, than the character which Mr. James Pilkington has been led, by his religious prejudices perhaps, to affix on the people of this County, of rude, indecent and profane*, as applied to the Farmers, or to any other class of Persons in it: as a residence continually changed among them, during the greater part of three years, fully enables me to affirm; and justice, not less than a sense of gratitude calls on me, to bear testimony on the contrary, to their civility and orderly conduct, as well as to their hospitality, and great readiness to communicate and furnish information, even at considerable trouble to themselves: as I trust that these Volumes, and those which I hope hereafter to submit to the Public, will lastingly shew.

## SECT. III.—RENT.

The Farms in Derbyshire, appear to be pretty generally held from Lady-day to Lady-day. The Rents of Lands near the principal Towns may be considered as high; 40*s*. to 60*s*. has been mentioned as the Rents per acre near Buxton Town. In Measham the average Rent seems about 63*s*., principally occasioned by Irrigation and other capital improvements by the late Joseph Wilkes, Esq. and his successors. In Stapenhill

* See "View of Derbyshire," Vol. II. p. 59.

some

some Farms are let at 47*s.* per acre: in Kirk Ireton 20*s.* has been mentioned as the average Rent per acre, and 16*s.* as the average in Ashover; at Newhaven in Hartington, new allotments 10*s.* to 14*s.* per acre.

Some idea of the gross Rentals of the several Hundreds and of the County collectively, including the Waste Lands, Roads, Waters, &c., on the one hand, and the Rents of rated Houses, Manufactories, Mines, Collieries, &c. on the other, but not unrated Cottages, from the last column in the folding sheet on the Poor's Rates, facing page 34, calculated according to the sums raised, in the year to Easter 1803, for parochial purposes, and the average Rates of the same on the Pound Rental, stated in the Poor's Rates, as returned to Parliament by the several Overseers; whence it appears that a Rental of 378,584*l.* was rated 4*s.* 1½*d.* in the Pound (or rather perhaps 4*s.* 1*d.*, as results from the averages of the several Hundreds), to produce the sum actually raised in that year.

The above Rental is something below a 64th part of the Rental of the 52 Counties in England and Wales, deduced from their similar Returns. Calculating with this Rental of 378,584*l.* and the 622,080 acres which Derbyshire appears to contain (I. 76), it gives an average Rental of 12*s.* 2½*d.* per acre of surface: while the average of all the surface of England and Wales (reckoned at 37,267,000 acres, or near 60 times the area of Derbyshire) is 13*s.* 0½*d.* per acre. It is not to be doubted, but the sums rated in the Parish Books are mostly below the actual Rents and annual values of the Lands and Premises, Mines, &c. occupied by their owners; but in Derbyshire, this difference is probably less than in most other Counties, owing to the great number of general parochial valuations, by Commis-

sioners

sioners on Inclosures, and by Surveyors employed to regulate the Rates, which have taken place within a few years past, as observed p. 3.

## SECT. IV.—TITHES.

THAT Tithes are highly inimical to spirited Farming, may be pretty satisfactorily inferred, from the fact, observable in this as in all other Counties, of the extreme rarity of finding a spirited Improver, occupying Lands that are not either tithe-free, or whereon a modus or fixed composition is established: and not uncommonly, the prudent foresight of such men, have obtained leases of the Tithes of the parishes wherein they occupy, as well as of their own Lands. Perhaps about the usual proportion of the Tithes, are in the hands of the Clergy and of Lay Impropriators in this, as in other Counties: and it has been remarked to me, that the Clergy as often compound, and at as reasonable rates, for their Tithes, as the Laymen do. It rather surprised me to find, that the great Land-owners, had in few instances made provision for the security of their Tenants, and the consequent improvement of their Estates, by letting their lands tithe-free, in many instances where they possessed them, or in seizing every opportunity, of obtaining Leases of the Tithes from the Clergy and Lay Impropriators, in order to re-let them to their own Tenants, and the other occupiers, at fixed compositions: a practice by which, Men of great Landed Property might, and in many districts do, prove themselves real benefactors to the Country.

George H. Errington, Esq. who is the leasee under the Dean and Chapter of Lichfield, of the Tithes in

22 places in and near Derbyshire, usually re-lets those Tithes to the principal Land-owners in the place, with a view to their being charged with the Rents, on the occupiers. Dr. John Gardner of Bath, who owns all the Tithes in Brailsford, lately leased them for his life, to Charles Upton, Esq. his Steward, *in trust for the several occupiers for the time being:* I was sorry however to hear an opinion, that some inequalities prevailed in the rates of charging the gross sum on the several Farms: a modus of 1½*d.* per Cow is here established, and Corn and Grass pay about 6*s.* per acre on the average. Around Brailsford the Tithes are pretty generally gathered in kind, as they are in various other parts of the County. About Matlock, Darley, &c. it is usual, for the Clergy to have a Survey made annually previous to Harvest, by a Surveyor, who charges certain rates per acre on the different kinds of Crops of each occupier: these have been, Hay from 2*s.* 6*d.* to 4*s.* 6*d.*, Wheat 12*s.* to 14*s.*, Oats 7*s.* to 10*s.* 6*d.*, Barley 10*s.*, &c. Sometimes the Surveyor fixes a gross sum on the Tithes of a place, and agrees with the principal Occupier for the same, leaving the adjustment of the sum to be paid by each Farmer, to be settled among themselves, at a meeting: and it argues I think no small degree of liberality and knowledge, among them, that this is generally done with readiness, and with great fairness. In Wirksworth Grass land pays 4*s.*, Wheat 12*s.*, Oats 8*s.*, and Barley 10*s.* per acre, as compositions for Tithes.

My Colleague or Predecessor, Mr. Thomas Brown, proposed (p. 54 of the original Report), that Tithe-owners should be restricted from taking extra Tithes, from lands improved by expensive means, unless they contributed one-tenth of the cost of such improvements: and

and it were much to be wished, that this or some other expedient could be adopted, for removing this grand bar to improved cultivation. When I was upon what I consider to be the largest cultivated Farm in the County, the occupier told me, that the Tithes of their Parish were on sale, and if, as was expected, the Tithes should be gathered in consequence, he would certainly lay all his land down to grass, and confine his business to Breeding, Grazing and Dairying!

The earliest of the Inclosures by Act of Parliament in this County, provided for the Tithes by allotments of Land, but afterwards it fell into disuse, and the greater part of the more modern Inclosures, have left the lands subject to Tithes, owing, as was thought, to the demands of the Tithe-owner being excessive, but which is now viewed in a very different light in several instances, and the neglecting to remove at any rate this grand evil of the Farmer, is heartily repented of by many. In several of the recent Inclosures the Tithes have been commuted in Land: I heard but of one instance of a Corn-Rent in lieu of Tithes, and that is at Beighton.

It does not appear, that Tithe of Lead Ore is paid, except in Eyam and Wirksworth Parishes, as observed Vol. I. p. 365 and 370, although since 1658 the Clergy of Ashover, Matlock, Darley, Bonsal and Carsington, instituted frequent suits, to endeavour to obtain the same; and in 1701 even went so far, as to procure a Bill to be brought into the House of Commons, alleging, that the custom of paying Tithe of Lead Ore extended to the whole County, and praying enactments, "to prevent the multiplicity of *vexatious suits*," relating thereto. The subject of Tithes will be further adverted to in Sect. 5 of Chap. XVII.

SECT.

## SECT. V.—POOR'S-RATES, AND OTHER PAROCHIAL TAXES.

In the 43d year of his present Majesty, Acts were passed, for procuring Returns relative to the Expence and Maintenance of the Poor in England and Wales; and with astonishing Labour, and apparent correctness on the part of the Parish Officers of 14,711 Parishes, Townships or places (which separately maintain their own Poor in England and Wales), Returns were made up, and transmitted to the Secretary of State's Office for the Home Department; and the same were afterwards arranged in Abstracts, and numerous and important averages and comparisons with former Returns deduced from them, by *Mr. Thomas Poole*, whose care and accuracy in this laborious undertaking, is deserving of the highest praise: the huge folio Volume, containing these important documents, which was ordered to be printed by the House of Commons on the 10th of July 1804, will long remain a striking monument of Statistical Labour, and ought not to fail of attracting deep attention, to the portentous consequences of the rapid increase of the Poor and Poor's Rates, which are therein shewn, for each of the 14,711 places, in the intervals between the years 1776, 1784 and 1803. Had it been practicable, to have disposed the valuable particulars in this large folio Volume, which respect Derbyshire, into the pages of an Octavo, I would gladly have extracted the whole; as it is, I must content myself with giving in a sheet, to fold out opposite page 34, the summary or totals of each of the seven Hundreds of the County, the title and particulars being the same (with the exception of the last column, which I have added) as for each of the

the 14,711 places in England and Wales; by which the magnitude and importance of this volume may be guessed at, by many of my Readers who may never have the opportunity of consulting it. At the bottom I have added, the total particulars of England and Wales, for the use of those who may wish to make comparative calculations, either for the whole of Derbyshire or any of its Hundreds.

The particulars of Derbyshire in the columns of this Table, which relate to the year to Easter 1803, were compiled it is said, from 317 Returns; those which relate to the years 1783, 4 and 5, were deficient nine returns, and those of 1776, 13 returnsbelow this number.

From column 7 in the above Table it appears, that 78,219*l.* was expended in Derbyshire in the year ending Easter 1803, the produce of different Parochial Rates on the occupiers, of which 19,554*l.* was expended for purposes distinct from the maintenance of the Poor; such as Church-Rates, County-Rates, Highways, Constable's-Rates, Militia, &c. (column 6), and 4,205*l.* in the removal of Paupers and suits of Law relating thereto. Expenses of the Overseers and other Officers, &c. (column 5), which last is rather less than 13*d.* in the pound, on the total Parochial Rates and expenditure: while the expenses in this column, amount to little more than 8½*d.* in the pound of Rates, on the average of all England and Wales: the excess in this case, being perhaps in part explainable, from the vast numbers of Apprentices which have been taken by the Cotton Spinners from the Metropolis and the Southern Counties, to which they have since returned, and on being there chargeable, are sent back, many of them, with several children, at the entire cost of the Derby-

 shire

shire Parishes, which have, I fear, most serious expenses indeed of this kind, to look forward to, in a few years time. The amount of other parochial expenditure, besides for the Poor, in column 6, is 5s. in the pound on the whole expenditure in column 7, in Derbyshire; but is little more than 3s. 10¼d. in England and Wales collectively: this may arise, from the greater number of expensive Bridges (see p. 22), which this County has to maintain out of the County Rates, and Roads also perhaps, than in the average of England and Wales is the case. The pound rate for Parochial purposes, appears to average 3¼d. less annually in Derbyshire, than in all England, and 4d. less than in England and Wales collectively. This Table I shall have further occasion to refer to, in speaking of Roads in Section 1, and again of Poor's-Rates in Section 8 and 10 of Chapter XVI., as also in Section 6 of Chap. XVII. I cannot however refrain from here remarking, on the very large burdens which *a part* of the Occupiers of England and Wales must sustain, in loss of time and actual expenses, over and above the 8½d. in the pound which appears charged in the Parish Books, for assessing, collecting, managing, expending and accounting for, this 5,302,071*l.* annually; and pointing out, how much the real Parochial burthens, exceed the amount generally mentioned; as well as the vast disproportion of these expenses of management, to those which attend the assessing, collecting, managing, expending and auditing, the various other burdens to which the nation is subjected.

As a few instances of the Rates in particular places, I noted, that in the Township of Belper, the Poor's Rates were *twenty shillings in the pound*, previous to their

[To face page 34.

| 5. | | | 9. | | | | | 3. | 14. | 15. | 16. | 17. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Removal of Paupers, and Expences of Overseers and other Officers. | | | …y Earned by the Lab… the Poor, towards t… …intenance, and accoun… to the Parish or Pla… …tinguishing | | | | | Age, or disabled from Labour by permanent Illness or other Infirmity. | Number of Persons Relieved, not being Parishioners. | Number of Friendly Societies who hold their usual Meetings within each Parish or Place. | Number of Members in the said Societies. | Number of Children in Schools of Industry. | Rated Rental, deduced from Columns 2 and 3. |
| | | | Out of any House of Industry or Workhouse. | | | Money so Earned in any House of Industry or Workhouse | | | | | | | |
| £ | s. | | | s. | d. | £ | s. | | | | | | £ |
| 79 | 11 | | | 4 | 10 | 6 | 2 | 443 | 47 | 29 | 2,588 | 36 | 86,110 |
| 23 | 13 | | | 9 | 7½ | 300 | 6 | 225 | 71 | 9 | 449 | — | 14,620 |
| 04 | 10 | 1 | | 12 | 0 | 10 | 18 | 456 | 401 | 56 | 6,165 | 53 | 51,200 |
| 22 | 0 | | | 0 | 5 | 9 | 15 | 388 | 232 | 53 | 3,891 | 47 | 51,102 |
| 92 | 12 | | | 16 | 8 | 1 | 4 | 187 | 78 | 15 | 1,944 | 24 | 45,00 |
| 52 | 17 | | | 7 | 7½ | 54 | 5 | 621 | 164 | 70 | 5,128 | 107 | 87,07 |
| 31 | 1 | | | 4 | 10 | 85 | 16 | 268 | 520 | 35 | 2,516 | — | 43,47 |
| 05 | 6 | | | 16 | 0 | 468 | 9 | ,588 | 1,513 | 267 | 22,681 | 267 | 378,58 |
| 39 | 4 | | 6 | 19 | 7 | 70,970 | 13 | ,571 | 190,107 | 9,347 | 674,220 | 21,037 | 23,709,75 |
| 33 | 12 | 1 | 7 | 1 | 11 | 108 | 11 | ,258 | 3,945 | 325 | 30,130 | 502 | 523,20 |
| 72 | 17 | | 4 | 1 | 6 | 71,079 | 5 | 6,829 | 194,052 | 9,672 | 704,350 | 21,589 | 24,232,95 |

☞ …ted.

their being regulated by a survey and valuation, by Mr. John Nuttall, and 15*s*. or 16*s*. since! This Surveyor, in ascertaining the comparative values of Buildings, for the purposes of Rates, takes their cubic contents in three different classes. In Holbrook Township, the Rates are very high, owing to the Stockingers, as is said: in Glossop 5*s*. on their new Rents; in Walton on Trent, 4*s*. on the Rack Rent: in Foremarke and Repton 3*s*. on the Rack Rent: in Brailsford 2*s*. to 1*s*. 6*d*.: in Bretby 1*s*. 6*d*.: in Buxton 1*s*.: in Markeaton 10½*d*. &c. In the Parish of Marston Montgomery they had 89 acres of open common, which was more than 20 years ago enclosed, and vested, for the reduction of the Poor's Rates, a practice worthy perhaps, of more general imitation.

## SECT. VI.—LEASES.

The granting of Leases for three Lives, probably had some prevalence formerly in Derbyshire; at present three Farms in Parwich, and one at Mackley in Sudbury, are the only remaining instances that I heard of: though several such had not long been extinct in Brailsford.

The number of those Land Owners who see the propriety of granting Leases, for their own and tenant's benefits, are comparatively very small, and unfortunately, their number seems rapidly decreasing, in Derbyshire, as well as elsewhere; the example of the Duke of Devonshire, who grants no Leases, and yet is considered one of the best*, as well as the largest

* See Mr. William Mathew's excellent general observations on this subject, in the "Letters and Papers" of the Bath Society, vol. xii. p. 297.

 Land-

Landlord in the district, having probably contributed a good deal, to bring them into disuse. That those steady principles of honour towards his Tenants, and vigilance to check any occasional deviations therefrom in his numerous Agents, which happily seem to have grown hereditary in the Family, should have left his Grace little to wish, or to expect, of the benefits which usually result from Leases, I can readily conceive, from having witnessed upon various parts of his Estate, such expensive improvements making by *his* Tenants at Will, as I should scarcely have believed from any one who mentioned them: Houses and Premises Built, or completely Repaired, Fencing, Draining, Liming, Planting, &c., to the amount of some Thousands of Pounds on single Farms, and even Collieries effectually opened, on a good scale, by Tenants at Will! I confess, however, that I did not see and hear these things with unmingled sensations, principally from knowing, that the surrounding Gentry were too generally and often saying, "if the Duke of Devonshire, without tying up his Estates by Leases, can have these things done upon them, why should I not expect similar exertions in my Tenants?" and it is too natural, for us to suppose the contrary, that if a supineness does not follow such reasoning, that exhortations, injunctions, threats, and even changes of Tenants at Will, will be tried, rather than the only true expedient, that of granting Leases, which shall remove all doubts or hesitation in the mind of a Tenant, or the relatives and friends who advise him or assist him with pecuniary means, as to the propriety of immediately setting about every practical improvement of the Land he occupies. Viewing the subject in this light, I think, that honourable mention ought to be made of the few Landlords who have,

have, and continue to grant Leases of their property, in all suitable cases, viz.

Sir Joseph Banks, Bart. some of 21 years, in Ashover.
Sir Hugh Bateman, Bart. some of 21 years, in Hartington.
The Earl of Chesterfield, some of 21 years, in Bretby, &c.
Edward Coke, Esq. some of seven years, in Longford: these prohibit the immediate successions of white-strawed grain crops, and stipulate for Draining.
Manchester Hospital's Trustees, some of 21 years, in Sutton on the Hill.
The Earl of Mansfield, in Ballidon.
Earl Stanhope, some of 21 years, in Dale and Stanton.
The Marquis Townshend, some of 21 years, in Bradburne and Walton on Trent.

And to these I ought perhaps, to add the names of Sir Henry Crewe, Bart., Sir Thomas Windsor Hunloke, Bart., Clement Kinnersley, Esq., and the late Sir Sitwell Sitwell, Bart.; but I am not sufficiently acquainted with the particulars, which I heard casually mentioned, of their granting Leases, to say more respecting them.

Near to this County, the Earl of Moira has granted Leases for 21 years of two Farms on Ashby Wolds in Leicestershire (a common lately divided by act of Parliament) to Mr. John Johnson, and to Mr. Joseph Hough; who have built their own Houses and Premises, and inclosed and divided their Farms, his Lordship having found Posts and Rails. A plan and elevation of Mr. Johnson's new Farm Premises has been given by Mr. William Pitt, in his Leicestershire Report, p. 24; and I am enabled to state, in addition to his account, that these Union Farm Premises cost Mr. J. 1120*l*.

 and

and that he pays 12*s*. 6*d*. per acre Rent for his Farm. Although situated without the bounds of my particular Survey, I shall have several occasions to refer to this Mr. Johnson's excellent management, who was many years a Bailiff and Tenant, under the late Joseph Wilkes, Esq. in Measham.

Near also to this County to the west, the Earl of Derby has many Farms on Lease, in the Townships of Macclesfield-Forest and Wild-boar Clough in Prestbury, Cheshire; these, for a long period have been let on Leases for three lives; for which, terms of 14 years are now substituted by his Lordship, as the Leases fall in. The highly improved state of these mountainous Lands, about Shutlings-Low, Forest-Chapel, &c. owing to the effectual Draining and Limings which were done under these Leases, when compared with the state of the Woodlands of Hope, which seem a blot even in the maps of England, though on exactly similar strata, and little if any thing more elevated or uneven, or further from Lime-Kilns, is one of the best practical instances in favour of Leases, that I am perhaps able to produce.

I was unable to obtain any information, as to whose Leases they were in the High Peak, that Mr. Brown alludes, in the original 4to. Report, p. 45.

The Leases of the Earl of Chesterfield's Farms, require his Tenants to plant and protect a certain number of young Timber Trees, either in patches assigned for clumps, or in the hedge-rows, as directed by his Agent, who has printed an accurate set of instructions, which will be noticed in Sect. 3 of Chap. X.

The Leases existing in Derbyshire, or the verbal lettings at Will, seldom now contain any Boons to the Lord, such as Ploughing his Lands in hand, &c. which

which used to be common formerly: Carting of Coals, and repairing of the private Roads, or performing the Landlord's statute-duty, still remain in some few instances, in Stanton in the Peak, Glapwell, Keddleston and Alderwasley, as I have been informed. Keeping a few sporting Dogs for the Landlords, seems the only thing of this kind, that can at all be said to prevail, at this day.

The Covenants or agreements for letting Farms, seldom go further, than mentioning the proportion or quantity of land which is to be in tillage, without reserving any particular lands as ancient Pasture or Meadow, not to be broke into by the plough; and almost throughout the Country, it seems left almost entirely to discretion of the Tenants, which parts of their Farms they shall break up, or lay down; and in consequence, we see here, few fields kept in Pasture or in Arable, which would be more profitable in an opposite state, as very frequently happens in the more Southern Counties, where the Landlords seem almost compelled to interdict the ploughing of pasture land, tho' it may be contrary to their Tenants' and the Public interest, on account of the unconquerable passion of the Tenants, for repeatedly cropping new lands with white-strawed Grain, until such are equally or more foul and exhausted, than any old ploughed lands on their farms. When speaking of the Obstacles to Improvement, in Sect. 6 of Chap. XVII., I shall perhaps have occasion again to introduce Leases, wherein absurd Clauses are found, or the want of these important Contracts, is experienced.

## SECT. VII.—EXPENCES AND PROFIT.

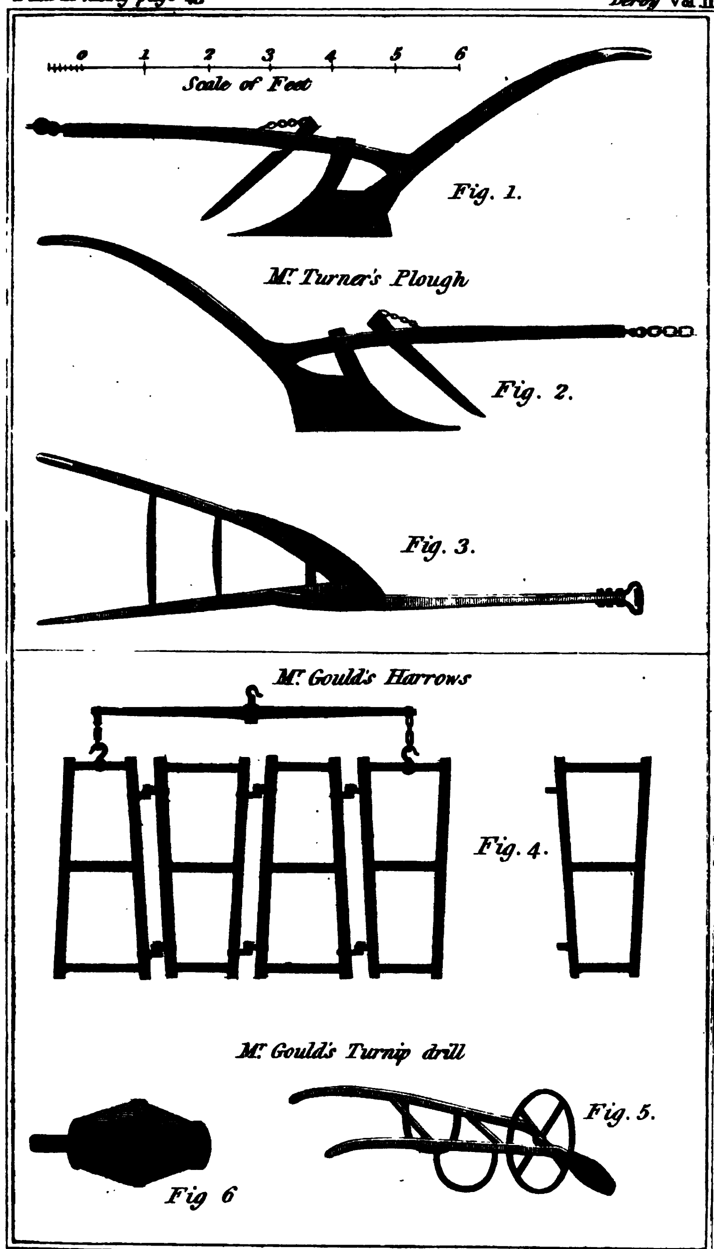
THE propriety never appeared to me, of asking particular questions, whose answers were to be stated under this head, nor do I see the necessity now, of adding anything to the many general or hypothetical Calculations on this subject, which my Colleagues in the Reports on some of the adjoining and many other Counties, have furnished. I may remark, however, that Farming seems to have been a far less profitable pursuit, than the many species of Manufactures carried on in the district; and that where great numbers of the latter class have risen into considerable opulence: an instance of a Farmer (Mr. George Allen, of Stubbing-edge in Ashover) who had acquired a large Sum of Money, was pointed out to me, as a very rare occurrence: and here even I suspect, that the successful cultivation of Chamomile-Flowers, and other things that can hardly be called Farming, and perhaps the fortunate investure of his property since it began to accumulate, has done more towards it, than Farming has ever done.

The subject of *Farm Accounts* seems more properly introduced here perhaps, than in any other place: and I have principally to notice thereon, the great pleasure which I repeatedly experienced in Mr. Francis Blaikie's Office, the Agent of the Earl of Chesterfield, at Bradby Hall, in inspecting the very simple and yet satisfactory system of accounts, there kept, and in seeing his Lordship so often therein, taking that active yet dignified part, in the superintendance of his affairs, which could not but strongly recall to my mind, the habits of a late and justly-lamented Nobleman.—If any thing can stimulate

mulate the best exertions of an Agent, it is, the discerning eye and frequent inspection of his well-informed Employer, taking a proper part in his own affairs: while on the contrary, if his services as well as his accounts, are seen and to be judged of, only thro' the medium of perhaps the unfeeling, Law Auditor of the Estate, as too frequently I know happens, the principal stimulus to such exertions, as a good Agent has to make, in a Nobleman's affairs, is wholly wanting. His Lordship's System of Accounts, embrace every object *in store* upon the Farm, as well as money transactions.—Respecting every Hay-stack, for instance, there is recorded,—the date when carried,—where from,—number of Waggon Loads,—observations, as to how it was got, and heated, the estimated number of Tons, and the particular uses to which it seems best adapted: and in an opposite page of the same Book, is afterwards entered, the date when cut,—where used, and by what stock,—the Tons and Cwts.,—observations, as to its quality, &c. and the comparison of the estimate with the real weight: another page contains a summary of all the Hay-stacks of each Year, as above: the accounts kept of each Corn-stack, mention the date when carried,—where from,—number of Threaves (24 Sheaves),—observations as to the variety of the Grain, how got, what kind of a Crop, and whether blighted at all, &c., and an estimate of the strikes or bushels: and opposite, the time when Thrashed, where stored, to whom Sold, &c.,—number of Strikes, observations as to the Sample, and a comparison of the estimate and produce. And so of all the various departments of Stock, dead and alive, and of which a particular and accurate valuation, is annually made out: the amount of which at Christmas 1808 was 4088*l*. 15*s*.: by such a system

a system of accounts it can at all times be seen, how the wants and means of the Farm, are apportioned to each other. Instead of enlarging on this subject, I would rather advise, such as were about adopting or improving their system of Farm Accounts, to visit Bradby Farm, and converse with the very intelligent Gentleman who has it, and his Lordship's other concerns, in his care: convinced that such trouble will be amply repaid by the various information acquired.

CHAP.




Joseph Farey delin. Neele Sc. Strand

# CHAP. V.

## IMPLEMENTS.

### SECT. I.—PLOUGHS.

THE Ploughs used in Derbyshire are of various kinds, tho' none of them are very peculiar in their construction: Wheeled Ploughs seem most to prevail, I think. In the course of my enquiry on this head, I noted the persons in and near the County, who were mentioned as extensively supplying the Farmers with this essential article; these *Plough-wrights* are,

Mr. George Alsop of Longford.
Mr. ——— Alsop of Foston in Scropton.
Mr. James Evans of Hartshorn.
Mr. William Fletcher of Linton, in Church Gresley.
Mr. James Fox of Glapwell.
Messrs. John Hanford and Wm. Davenport of Hathern Turn, near Loughborough, Leicest.
Mr. ——— Hanshaw of Weston on Trent.
Mr. Peter Hibbert of Baslow.
Mr. William Osbiston of Turnditch.
Mr. Richard Turner of Ridgeway in Eckington.
Mr. John Webster of Cross o' th' Hands near Turnditch in Duffield.
Mr. John Wright of Worksop, Notts.

Mr. James Evans, makes single shared Ploughs, with two wheels; the point of the share only 12 inches behind

hind the bottom of the wheels: price Four Pounds: two-shared Ploughs on a similar construction at Seven Pounds. The wheels are separately adjustable in height and width: the weight of his single Ploughs complete 1¼ Cwt.: double ones 3¾ Cwt. Mr. E. has followed nearly the same construction, for 40 years past, and during many of the late years, has made 50 new ploughs annually, I understand.

Mr. Fletcher charges Three Guineas for his one-shared, and Six Guineas for his two-shared Ploughs.

Mr. Hibbert charges 3*l*. wheeled, made very strong for Rocky Land.

Mr. Brown, in the original 4to. Report, p. 31, gave a drawing of the two-wheeled Ploughs, then in use about Repton.

The different Ploughs and other Implements usually made for sale by Messrs. Hanford and Davenport, are drawn and described in Mr. Pitt's Leicestershire Report, page 395.

In Plate II. (facing page 43) figs. 1, 2 and 3, I have given the two Side Views and the Plan, of a Swing Plough made by Mr. Turner, in considerable numbers.

At Hathern Turn, double-boarded Moulding-ploughs for Potatoes and other drilled Crops are made; Mr. Greenwood of Newhaven Farm in Hartington, seemed to me, to make a good use of this Implement.

In the original 4to. Report Mr. Brown gave a view of the Northamptonshire Draining-plough, p. 41. Draining or open Trench Ploughs are made at Hathern Turn for sale, as described in Mr. Pitt's Report, p. 395: these Implements seem however but little used in Derbyshire, covered Drains being very properly preferred.

On the construction and principles of Ploughs and ploughing,

ploughing, I cannot do better than refer to Mr. John Bailey's able investigations in the Durham Report, pages 300 to 404: see also the article *Agriculture* in Dr. Brewster's Edinburgh Encyclopædia.

## SECT. II.—HARROWS.

Mr. Joseph Gould of Pilsbury, has his harrows made small and simple, so that four similar ones are usually hooked together, and the extreme ones are fastened to a whipple-tree when in use: as represented in fig. 4 of Plate II.: these he finds more economical and lasting than larger Harrows, consisting of several pieces of wood, the splitting or breaking of any one of which, often occasions delay, or the ruin of the whole Implement, but by having these detached parts all made alike, and several of them in store, they can be quickly changed in case of accident.

The pulverising Harrows made at Hathern Turn on the Loughborough Road, are described in Mr. Pitt's Report, page 399. At Bradby Park the Earl of Chesterfield has a Bush-harrowing or Thorn-bushing Machine, mounted on two low wheels in front, and which is loaded with weights in the middle, according to the degree of pressure wanted on the Thorns at the tail.

## SECT. III.—ROLLERS.

Rollers of wood and of stone, are used, in different parts of Derbyshire, without any peculiarity of construction that struck me: at Locko-Park I saw a heavy Iron Roller for grass land in the Spring, which had weights

weights that screwed on inside it, to weight it, for different Lands. Mr. Philip Oakden, of Bentley Hall in Longford, I observed using a spiked Roller on his Fallows. At Earl Moira's at Donnington Park, they use a Roller consisting of two spiked cylinders in one frame, so contrived, that the spikes clear each other of dirt as they turn round: of this Implement Mr. Pitt has given a drawing at page 59 of his Leicestershire Report. Mr. John Smith of Repton uses a spiked Roller; they are also in use in Dronfield and in Norton.

On Mr. Joseph Butler's, Norbrigs Farm, I saw a fluted or fallow Roller, consisting of circular plates of wrought iron, between cylindrical wooden Rings: which, as this intelligent Farmer admitted, on my pointing it out, is inferior in simplicity, and effect in breaking down fallows, to the solid wedge-like rings of cast iron, with a hole thro' them, to receive a stout wooden axis, called a drill roller, which is used in many of the southern counties, with good effect.

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## SECT. IV.—DRILLS.

Drilling being far less practised in this County than it ought to be, I have not much to notice under this head. I saw Cooke's well-known Drill, on the Farms of the Earl of Chesterfield at Bretby, Mr. Johnson of Ashby Wold (late of Odd-house Farm in Measham, where he used it on his own, and on several neighbours' Farms *for hire)*, and Mr. Edward Brown of Ingleby. At Stapenhill Mr. Thomas Lea used a simple and useful Drill, made by William Spragget of Harbury near Rugby, Warwickshire, which was accompanied by a useful table of directions for setting it to

sow

sow at 7 or 8 inch distances, Wheat, Barley, Oats or Vetches, from 1 to 5 bushels per acre; the feeding brushes being so set, that a certain number of turns of the feeding-wheel, delivered one pint of seed at one of the Coulters: also the like for Beans and Pease at 10, 12, and 14 inch Rows, and 2 to 5 bushels of seed; and Turnips at 9, 10 and 12 inch distances, and 1 to 2 lb. of seed per statute acre.

Mr. Joseph Gould of Pilsbury, uses a very simple and effective hand Turnip Drill, which is represented in fig. 5 of Plate II. facing page 43; it is framed like a very light wheel-barrow, the axis, of wood, projecting to one side, on to which a tin seed-box pushes, and fits tight at different places, according to the intended distance of the rows. The tin seed-box is shewn on a larger scale in fig. 6, of which different sorts, with holes thicker or thinner, for the different quantities of seed to be sown per acre, can be kept in a dry place in the house, when not in use, and the drill itself, from its lightness, can be put up into a loft, or tied up to the roof of any out-house, when not in use. A more simple and yet efficient machine than this I scarcely ever saw, and the only defect mentioned was, that of the seed-holes clogging after a sudden shower of Rain: which is easily obviated, by having a tin shade or cover projecting from the frame of the drill, as in the original model of this machine presented to the Society of Arts by the Rev. T. C. Munnings, and preserved in the Repository of that Society in the Adelphi for public inspection: and of which a plate and descriptions will be found in the 19th volume of their Transactions: perhaps if the shade were made to turn up on a hinge, or take away and fix on some part of the frame, out of the way of accidents, during fine weather, it might be desirable,

desirable, that the driller may the better see the operation of the seed holes.

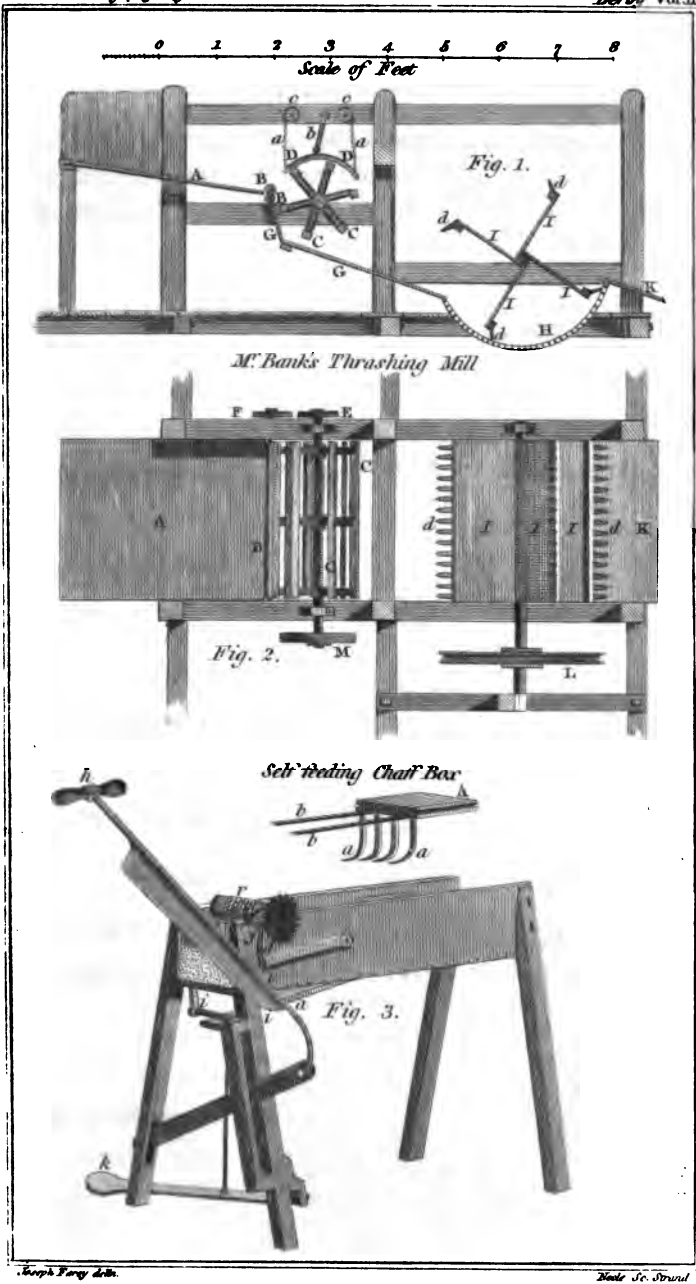
## SECT. V.—HORSE-HOES.

MR. JOHN JOHNSON, previous to his entering on Union Farm, when he lived at Odd-house Farm in Measham, used a Cooke's Horse-hoe a great deal, in hoeing drilled Corn, *for hire*, in the neighbourhood, at the recommendation of the late Joseph Wilkes, Esq.

## SECT. VI.—SCUFFLERS.

I SAW a few improved implements of this class, at Barton Blount Lodge Farm Mr. John Webb, Bradby Park the Earl of Chesterfield, Foremarke Park Farm Mr. Joseph Spurr, Great-rocks Lodge Farm Mr. John Lingard, Horsley Killis Farm Mr. Henry Fletcher, Locko-Park William D. Lowe, Esq. Repton Mr. John Smith, Ticknall Mr. Gilbert Hutchinson and Mr. Nathaniel Bryan: but none of them seemed to differ so much in their construction, from those common in improved districts, as to require any particular description. Mr. John Webb finds Ploughing and Scuffling of strong Land, as exposing it often to the Sun and Air, very preferable to Harrowing, which tends to consolidate and sadden the surface.

SECT.


0 1 2 3 4 5 6 7 8
Scale of Feet
Fig. 1.
A
B
C
D
G
H
I
K
Mr. Bank's Thrashing Mill
Fig. 2.
E
F
L
M
Self feeding Chaff Box
Fig. 3.
h
k

## SECT. VII.—THRASHING-MILLS.

THE spread of these important Machines, has been considerable in this county and its immediate vicinity, as will be seen by the following list of Farmers who have *Thrashing Mills*, viz.

| | |
|---|---|
| John Bott of Brailsford | Noon's. |
| Edward Brown (at his Cucko-Park Farm) in Ingleby | 3 horse, Kitson's 1808. |
| FletcherBullivant,(the late)of Stanton Ward | 4 horse, Lumbert's. |
| Earl of Chesterfield, Bradby Park | 4 horse, Noon's 1806. |
| Thomas Emery, of Mansditch Farm, in Catton | 3 horse, Noon's 1806. |
| Thomas Elton & Co. at Oakthorpe | 4 horse, Noon's 1809. |
| Thomas Frere (at his Farm near Hono Hill) in Stretton in the Fields | 4 horse, Lambert's 1808. |
| William Garman, of Persal Pits Farm, in Croxall | 4 horse, Noon's 1808. |
| Joseph Gould, of Pilsbury, in Hartington.. | 3 horse, Moire's. |
| Joseph Hazlehurst, of Unston, in Dronfield. | |
| C. Hodgson, of Woodhouse-Mill, in Hansworth, York. near Beighton (by water) | 2 horse, Banks'. |
| Abraham Hoskins, of Newton Solney | 4 horse, Noon's 1808. |
| John Johnson, of Union Farm, in Ashby de la Zouch, Leicestershire | 4 horse, Noon's 1806. |
| Rev. Nathaniel Palmer Johnson, of Wyman's Hill, in Aston on Trent | 5 horse, Farmer's 1808. |
| John Lathbury, of Horninglow, near Burton, Staffordshire | Noon's. |
| John Lingard, of Great-rocks Lodge, near Wormhill | 3 horse, Wigfull's 1797. |
| William Sadler, of Plesley | 1 horse, Pinder's 1800. |
| Edward Scolefield, of Barlborough. | |
| John Smith, of Donisthorpe | Noon's. |
| John Spencer, of Rolleston Park, in Tutbury, Staffordshire | 2 horse, Perkins' 1806. |
| John Staniforth, of Beighton Mill (by water) | 2 horse, Banks' 1808. |
| —— Ward, of Gleedless Common, Yorkshire, near White Lane, in Eckington | 2 horse, Banks'. |
| William Webb, of Haslehour, Staffordshire, near Edingale | Noon's. |



Mr.

Mr. Lingard has the merit of taking the lead for some time, I believe, in the introduction of these important Machines into Derbyshire: all of which, except Mr. Staniforth's and Mr. Hodgson's, are wrought by Horses, and these are attached to their water mills.

The names and residences of the Makers of the above Machines, as far as I noted them, are as follows, viz.

George Banks of Whiston near Rotherham, Yorkshire.

——— Farmer, Warwickshire.

Benjamin Kitson, of Bridgenorth, Shropshire.

——— Lambert of Burton on Trent, Staffordshire.

Richard Lumbert of Wick-Rissington, Gloucestershire.

William Moire (late of Northumberland), Shropshire.

Thomas Noon of Burton on Trent, Staffordshire.

Christopher Perkins of Marygate, in York.

——— Pinder of Bawtry, Yorkshire.

John Shaw of Willow Row, Allsaints, in Derby.

Thomas Wigfull of Aldwark near Rotherham, Yorkshire; afterwards of Lynn in Norfolk.

In Plate III., figs. 1 and 2, facing page 49, I have given a Section and Plan of the operative or Thrashing part, of Mr. Banks's Machines, at Beighton Mill and Gleedless Common. A is the Feeding-board; B, B are the Feeding Rollers; C C C, &c. the Thrashing-Drum (rather improperly so called in this case) consisting of six wooden bars shod with iron plate, each supported on three open arms; D D the Bed, a segment of a cast-iron Cylinder fluted inside, supported by four chains *a a*, and steadied by two coupling-bars *b*, the height of which Bed can be adjusted and altered, by turning

turning the bars or axles, on which the pulleys *c c*, to which the chains are fastened, and which are prevented by ratchets from receding. The iron axle of the Thrashing-drum has a pinion E on one end of it, which works the wheel F, for turning the feeding rollers, by the intervention of an intermediate dead or loose wheel, adjustible by screws; and the maker furnishes different sets of these pinions and wheels, which regulate the proportionate velocity of the drum and rollers. G G is a boarded partition and floor, under the drum, and H is the barred grating, on which the thrashed Straw is tossed by the four rakes *d d d d*, at the ends of four close boarded arms I I I I, and finally discharged at K. The Thrashing-drum at Gleedless Common, is 16 inches diameter, and is turned by a strap, working on the pulley M, also 16 inches diameter: which works off a strap-drum 8 feet diameter, on whose axis is a rope-pulley 9 inches diameter; whose rope, works on the rake pulley L, 36 inches diameter, and thereby turns the rake, 36 inches diameter, with a slow motion. The strap-drum axis has a cast-iron pinion of 22 teeth fixed on it, which is turned by a wheel 6 feet diameter with 100 teeth, on a horizontal axis, (passing under the horse-walk), which has at its other end a pinion of 18 teeth, wrought by a crown-wheel 11½ feet diameter with 144 cogs, on a vertical axis, to which the Horse-levers are fixed; of such a length, that the middle of the horse path is 22 feet diameter. At Beighton Mill the strap-drum for working the drum pulley M, and the rope-pulley for working the rake-pulley L, are fixed on a horizontal axis of the Water-mill Geer, for grinding and dressing Flour. These machines seem under calculated at two-horse power, and ought rather to be called three-horse machines.

 Mr.

Mr. Farmer's machine at Wyman's Hill, thrashes clean, and winnows, 14 quarters of Barley in 8½ hours, and 12 quarters of Wheat in the same time, as Mr. Benjamin Kirkman the Bailiff informed me.

Mr. Kitson's machine in Ingleby was at first under calculated, as a two-horse machine, but was altered for three horses, and seems to me now to feed too fast, as it does not thrash Barley clean, though as much so as the flail usually does. Of the crop of wheat of 1807, it thrashed with three horses, six quarters in six hours, which was not winnowed by the machine, but by a hand winnowing machine. It cost 55*l.* to 60*l.* at first, besides the alterations.

Mr. Lambert's machine in Stretton in the Fields, thrashes clean, but is not well enough made in some parts, to endure long, the rapid motion and wear to which they are exposed; a fault very common in these machines: the horse-levers are out of doors, and consist of slight long arms, supported by chain-braces from a centre pin, or continuation upwards of the vertical axis, and by cross poles from one arm to the other: the wheel-work is below. The corn is fed obliquely, and not with the ears directly foremost as usual: a fluted iron Bed. A bevil pinion is fixed on the end of the drum spindle, and a wheel on a horizontal axle is worked thereby, which has a pinion moveable on it, to suit either of three concentric sets of teeth, in the face of a wheel on one of the feeding rollers, for the different sorts of grain, the middle set is for wheat.

Mr. Lumbert's patent machine at Stanton Ward, thrashes clean, but is frequently out of order, and the maker too far off: the horses require urging rather beyond their speed (the common fault of thrashing machines). There are two sets of feeding rollers, and the straw

straw is twice thrashed: the same speed of feeding for all grain, but the fluted Bed is set nearer or further from the rollers: the beaters are not more than ¾ inch high on the drum, and the space is filled with inclined iron plate, so as to convert the Thrashing-drum into a kind of long ratchet wheel.

Mr. Moire's machine in Pilsbury, thrashes clean, and winnows; cost 87*l*.

Mr. Noon's machines (Patent, Dated 1805) seem to thrash clean, to act well, and to give satisfaction to those possessed of them, where I have been: his beaters are hinged, and cannot therefore be injured by stones, &c. among the straw. In that at Mr. Hoskins' in Newton Solney, there are eight beaters on a two feet drum or cylinder three feet long, which makes 200 revolutions per minute, by the Horses going three Miles per hour, in a 24 feet walk; and the feeding rollers make each 100 revolutions in a minute; they are three-inch twelve-fluted rollers, the opening between which is level with the centre of the drum, which strikes downwards: the Bed is one-third of a cylinder, of fluted bars: the centres of the moveable beaters adjust, by screws, for different grain, and in fact increase or diminish the size of the drum: for Barley this is the largest, and the beaters pass as near as possible to the flutes of the Bed, for Oats and Wheat they clear them half an inch, and for Beans and Pease one inch: the machine complete, with rakes and caving fanners (except Brick-work, the Horse-wheel Shed, or fixing) 100 Guineas: these extras, done in the very best manner for Mr. Hoskins, cost about 50*l*.: this machine has thrashed, 70 bushels of wheat in 10 hours, and 100 bushels of Oats in the same time.

His Machine at Persal Pits, was stated to require

 four

four horses for sheaved Wheat and Beans, and three for loose Oats and Barley; the drum 33 inches diameter, revolves about three times in a second, and thrashes clean; it cost altogether 115*l.*

Of the Machine by this maker, at Union Farm on Ashby Wolds, Mr. Pitt has given a few particulars, page 62 of his Leicestershire Report: to which the following additions, and corrections in some few particulars, may not be improper. The cost of the machine was 100 Guineas, of Bricks and Lime and laying ditto 7*l.* and a Thatch-roofing to the Horse-walk 15*l.*, in all 127*l.* The diameter of the middle of the Horse track on the ground is 22 feet; the Horses go round six to seven times in a minute, and by each turn they cause the drum to revolve 77 times, the eight hinged beaters when extended, describe a circle 2¼ feet diameter, their centres being 12¼ inches from the axis of the drum: when the machine is set for oats, 4½ inches of straw is drawn in, while the drum turns once round, or almost 29 feet to one turn of the Horses. The Bed is a fluted quarter of a cylinder, begins half an inch below the centre of the lower roller; the two rollers are kept together by steel springs: the feeding is just opposite the centre of the drum, the length of which is two feet ten inches, and of the Beaters three feet one inch: they are of Oak, faced with iron plate, and beat downwards: the hinges or eyes for the rounded ends of the beaters, are of cast-iron, and are set further from or nearer to the axis of the Drum, by screws in long holes: Barley requires only one-fourth of an inch, but Beans three-fourths of an inch between the beaters and the top edge of the fluted bed, which projects an inch before the front of the rollers: the rate of feeding above mentioned, is increased for Barley, by changing a wheel of

of 20 teeth on the feeding roller for one of 37 teeth working in a pinion, thro' the medium of a loose or dead adjustible wheel: it has a straw rake and fanners, and thrashes very clean: of Oats in seven hours (inclusive of one hour's rest at times) 13 to 17 quarters (8×36 quarts) average about 15 such quarters; of Barley eight to ten, average perhaps nine quarters, and of Wheat 50 to 80 bushels, average perhaps 65 bushels; by the assistance of two Men and two Boys in the Mill. In section 4 of Chapter VII. I shall have occasion to advert again to this, and to another Machine in which Mr. Johnson has a share, and employs it in Thrashing the Corn of his neighbours *for hire*, a practice well worthy imitation.

Mr. Perkins' Patent Machine at Rolleston Park, Staff. seemed to want speed in the drum, and to feed much too fast for its speed: in consequence, it was thrashing sheaved Oats when I saw it, in a more slovenly manner than I ever saw straw turned out from the flail; numerous bells were untouched, and contained all their grains, altho' such fell out, on the slightest rub in the hand: it has a rake for discharging the straw, but no fanners.

Mr. Pinder's one-horse Thrashing Machine at Plesley, is the first on so small a scale, that I ever heard of as answering, after a competent trial: it is said to thrash about a Thrave and a half, or 36 sheaves of Wheat in an hour, and in eight or nine years has wanted no repairs.

Mr. Wigfull's machine at Great-rocks, has good speed, and thrashes very clean; it only shakes the straw, and hand winnowing machines are used, to dress the corn. It cost 120*l.* entire, and but few pounds

 since

since in reparations, perhaps 2*l.* in some late years; three Men and two Boys supply it, and bundle or *lap* up the straw from it.

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SECT. VIII.—CHAFF-CUTTERS, STRAW-CUTTERS.

CHAFF and Straw Cutters are in pretty general use, particularly in the southern parts of the County: the following Implement-makers appear to have furnished those of improved kinds, which I saw, viz.

Mr. — Darley of Worksop, in Nottinghamshire.
Mr. William Fletcher of Linton, in Church Gresley.
Mr. William Lester, late of Paddington, Middlesex.
Mr. Joseph Snow of Swarkestone.

Mr. Darley's machine, I saw at Mr. Joseph Gould's at Pilsbury. Mr. Fletcher makes a great many Straw-cutters, with straight knives on the edge of a double wheel, which were invented by Mr. Robert Salmon, and rewarded by the Society of Arts in 1796, in whose Repository in the Adelphi London a Model is preserved for public inspection, and a description and engraving of which will be found in the XVth volume of their Transactions, p. 280: for simplicity, ease of working, and keeping in Repair, I know of no Straw-cutter equal to this: they are sold by Mr. Fletcher at 10 Guineas each; and are in use at Mr. Thomas Lea's of Stapenhill, who first introduced them into Derbyshire: on the Farms of Mrs. Martha Evans, Mr. John Farmer, and Mr. Thomas Moss at Caldwell in Stapenhill; Mr. Henry Cooper at Drakelow, Mr. William Nadin at Stanton Ward, and many others. Mr. Lester's machine

chine I saw at Mr. Timothy Greenwood's at Newhaven: Mr. Snow has sold a great number with one knife, at Five Guineas, and with two knives at Ten Guineas.

Mr. Joseph Butler had experienced such great benefit, from cutting all the Hay and Straw given to his Farm and Colliery Horses, that when I was at Staveley he was erecting a small water-wheel on the stream from the Engine on his Norbrigs Colliery, and a Straw-cutter with two curved knives, on Cooke's original plan, to be worked thereby.

At Mr. Johnson's on Ashby Wolds I saw a simple and effective Chaff-box, which is made by Mr. William Fletcher of Linton, and by most of the Wheelwrights in the South of Derbyshire, and is in very general use: of which I have given a view in fig. 3 of Plate III. In the make of the Box and the Knife and the Presser, it very nearly resembles the Chaff-boxes so long in use, in almost every part of England, but is here made to advance the Straw, without occupying one hand of the Labourer, as in the old Chaff-boxes: this it does, by means of a block A, having 4 long crooked teeth *a a* to it, which slides on ledges nailed inside the box, near the top; this is advanced by means of two cords *b b*, that wind on an axis or roll *r*, having a ratchet wheel at one end. *a* is a strong Spring of Ash, fixed under the Box, which by means of the connecting levers *i i*, raises the Presser B, and releases the straw when the foot is taken off the treddle *k*; at the same time, a small click *d* moving on a joint, acts on the ratchet and advances the straw, the return of the ratchet being prevented by another click *f*, fixed by a joint. When the Box wants filling, the two clicks *d* and *f* are turned back out of the rachet, and the block A is drawn back and

and taken out, nearly at the end of the Box, where the ledges are left wanting, to allow it to lift up: and when the Straw, Hay, &c. has been put in, the Block is put down again by the same means; the roll is then turned, until the cords *b b* are tight, when the clicks are turned into the rachet, and the cutting then proceeds, as with the common Chaff-boxes, except that the Labourer by means of the cross handle *h*, can use both his hands with the best advantage, in cutting: his foot effecting, both the advance and the pressure of the Straw, by means of the treddle *k*.

This simple machine, still very much improved, is made at Four Guineas and a Half, by James Braby of Vine-street, Narrow Wall, Lambeth: and for which he has obtained a great many orders, from various Counties, in consequence of showing it at Lord Somerville's Cattle Exhibitions. Braby's machines will cut different lengths, and the motion of the Knife is also steadied by a coupling bar, in a most effectual manner, for making the Cut.

## SECT IX.—BRUISERS.

THE use of Bruisers for horse Corn is pretty much extended in this County: Mr. Thomas Noon of Burton on Trent has a patent for an improved Steel-Mill, for cutting Beans, &c.

## SECT. X.—WAGGONS.

I OBSERVED nothing peculiar in the structure of the Waggons, which are in general use in the southern and flatter parts of the County; in the hilly Districts Carts are more commonly used.

SECT.

## SECT. XI.—TUMBRILS.

Carriages under this name were never common, in Derbyshire, I believe; the use of Wains, drawn by Oxen, succeeded the Pack-Horses pretty generally, in the Hilly Districts, it seems, but have now almost entirely given place to Carts and Waggons, (see vol. I., p. 380), with nothing very peculiar in their construction: a Gentleman in Ashover told me, that he remembers there being neither Cart or Waggon in that Parish. At Clay-cross, and some other places near North Winfield, I saw very large rough Sledges, with four poles fixed up at their corners, used for drawing Bushes, &c. from one part of the Farms to the other.

## SECT. XII.—ONE-HORSE CARTS.

I found the use of One-Horse Carts, rather less general than I had been led to expect, from reading page 32 of Mr. Thomas Brown's original Report: indeed in the mountainous parts, they seem far less applicable, than the two, three and even four-horse Carts, there in more general use on the Roads, as each of these is furnished with considerable lengths of strong drag-chain, always fastened *to the top* of the hind part of the Cart, much in the manner that Mr. Benjamin Smith proposes to employ them for raising Horses which have fallen in the Carts in the streets of London, and for which the Society of Arts last Sessions, voted him Fifteen Guineas; see Vol. XXVIII., page 218, of their Transactions. In these Derbyshire Carts, each of the Horses are furnished

nished with strong Breechings, and Belly-Bands, and on arriving at the top of a steep Hill, the Carter takes off all his trace Horses, and hooks them to the drag-chains behind, which previous to this were looped up at the tail of the Cart: and it is surprising to see, with what safety, and ease, after a little training, the Horses thus succeed, in letting loaded Carts down most tremendous steep and long hills: on which I think it would be very unsafe to trust a one-horse Cart, with an adequate Load.

Messrs. William Jessop the elder and younger have very laudably exerted themselves, for six years past, at Butterley Furnace, in introducing One-Horse Carts, with cast-iron *cylindrical* wheels, 3½ feet high, and 6 inches broad on the rim, carrying 35 Cwt. on the private Roads made flat, and repaired with iron-slag, between different parts of their extensive works. In the first Report on the Highways of the Kingdom, ordered by the House of Commons to be printed on the 11th of May 1808, p. 42, an account of these Carts and Roads will be seen, and a plate of Cylindrical Wheels applicable to Carts of different dimensions. I was much gratified when at Butterley, by seeing the state of the Roads alluded to, and of other temporary ones across clayey lands to the iron-stone Pits, where no materials had been laid, and which yet, owing to the steady and uniform pressure of the smooth cylindrical iron wheels, had become hard in a surprising degree. Mr. Joseph Butler has also cylindrical iron wheels and One-Horse Carts in constant use, on his works at Wingerworth, Norbrigs and Killamarsh. When at Norbrigs Colliery, I saw several one-horse eight-inch cylindrical wheeled Carts, loading with 16 Cwt. of Coals (16 × 120 lb.) each, for the then Marquis of Titchfield, now Duke of Portland

Portland at Welbeck Park, Notts. Mr. Joseph Gould of Pilsbury uses light One-Horse Carts for carrying about Two-thirds of a Ton of Dung, Lime, &c. on his Farm, and for fetching of Coals; they cost about 9l. each. Mr. Joseph Hallam, wheel-wright, of Calver Bridge, makes a great many One-Horse Carts for the use of the Farmers of the district, where they are rather increasing, they usually carry 12 or 14 Cwt. in the hilly parts.

The late Joseph Wilkes, Esq. about 27 years ago, introduced Irish Cars at Measham, in his extensive Works and Farms, which by their cylindrical wheels, at less distances apart than other Carriages, and carrying less loads, had a material effect in improving the Roads.

## SECT. XIII AND XIV.—DRAINING-MILLS,

Or Sluices for such purpose, are almost unknown in Derbyshire, tho' these last seem wanting, for effecting the drainage of Syn-Fen (vol. I., p. 308), as I intend further to notice in Sect. 1 of Chap. XII.

## SECT. XV.—RAKES, HOES, SPADES, PARING-SHOVELS.

On the Earl of Chesterfield's Farm at Bretby, drag-rakes with tempered steel teeth are used, 11 inches long and 2¼ inches apart, and near 5½ feet long in the Head, for raking after the Cart in Hay and Corn Harvest, nearly similar to those made by Hanford & Co. of Hathern

Hathern Turn, and drawn in Mr. Pitt's Leicestershire Report, page 396, No. 11. Triangular Hoes of steel plate, fixed by their centre to the handle, and having three cutting-edges, I noticed to be in pretty common use, in the Gardens and Turnip-fields of Derbyshire. Hoes and Spades are manufactured at several places in Derbyshire, which will be mentioned under the head of Manufactures, in Sect. 8 of Chap. XVI.

## SECT. XVI.—WINNOWING MACHINES.

Besides the Winnowing Machines which are attached to several of the Thrashing Machines mentioned page 49; hand winnowing Machines or Fanners are in almost general use in the Barns in Derbyshire, and are much approved, for the ease and dispatch with which Corn is cleaned by them: the following makers of these very useful implements were pointed out to me, viz.

Mr. ——— Hubbal, of Orton on the Hill, Leicestershire.

Mr. Thomas Noon, of Burton on Trent, Staffordshire.

Mr. Sampson Rea, of Walton on Trent.

Mr. Joseph Snow, of Swarkestone.

The prices vary from about Seven Pounds to Eight Guineas, I believe.

At Mr. Joseph Gould's new Farm in Pilsbury, I saw a very simple and good contrivance for filling Sacks of Corn, holding open the mouths of the Sacks, tho' of different lengths, without suspending them, to tear the mouths.

## SECT. XVII.—BORERS.

THE tools and apparatus used in deep boreing for Mines have been described in vol. I., page 318: in boreing for Springs in Draining, the Augur Bit need not be gathered round so much, but left more open and like a Carpenter's Augur, on an enlarged scale: three or four lengths of rod are also fully sufficient in draining, and except in some rare cases of running Gravel or quick Sands, the Augur can be drawn up by hand: see Sect. 1 of Chap. XII.

## SECT. XVIII.—DRAINING TOOLS.

I NOTICED nothing particular respecting the Tools used in Draining in this County. Perhaps it may not be improper in this place to mention, that at the Keeper's Lodge in Bradby Park, the Earl of Chesterfield had a hair *rope-pump* erected, for raising the water 30 or more yards out of a well, by the adhesion of the water to the endless rope, as it revolved. *Water-screws*, or Archimedes's Pumps, are in use for raising water at Messrs. Strutt's at Belper, and also at the Cotton-Mill Apprentice House, near Cressbrook, in Tideswell. In Ilam Gardens in Staffordshire, near this County, there is a very simple and ingenious bucket lever Engine, which has supplied the House with water for many years past, see vol. I., page 507, where other Hydraulic Machines are mentioned.

## SECT. XIX.—SOWING TROUGHS.

ON Mr. John Lingard's Farm at Great-rocks in Wormhill, I saw a deal box 18 feet long and 4 or 5 inches

inches square, perforated with small holes at every three inches of its length, used for sowing Turnips broad-cast, which it had been found from long experience, to perform exceeding well; and much more regular than the hand, with a considerable saving of seed. Mr. Joseph Gould of Pilsbury uses a similar Box (from Norfolk) nine feet long, with which eight or ten Acres are sown in a day.

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## SECT. XX.—WEIGHING ENGINES.

THESE very useful machines are becoming very common, in several parts of Derbyshire: those erected on the Turnpike Roads, being extensively used for ascertaining the weights of loads of Coals, Hay, Straw, Manures and many other articles of commerce, between the buyer and the seller. In Ashburne a machine has been erected near the Market-place, at the expence of Mr. John Spencer, in order to weigh loads of agricultural produce and other goods for hire. The owner of a House in Compton near this Town erected a similar one near 30 years ago, and at present lets it with the House, to Joseph Cotmell, who charges *2d.* to *3d.* per Ton for weighing of different articles: it was made by Thomas Basset, and cost about *50l.*, its proportions being $1\frac{1}{2}$ lb. to the Cwt. In Wirksworth Mr. Charles Wright has a weighing machine, used by the public at *2d.* per Ton. At Matlock Old Bath Mr. James Cummings has a Weighing Machine, in public use. On Cromford Canal-wharf, at the end of that Town, there is a Weighing Machine for the use of those bringing or fetching goods therefrom: as is also the case on many other Wharfs and on the Rail-ways to or at most of the

large

large Collieries, as observed vol. I., p. 340. In St. Peter's, Derby, Mr. James Oaks has a Weighing Engine in his Waggon Yard. I saw a Weighing Engine for live Cattle on the Duke of Devonshire's Farm at Chatsworth, and hope soon to hear, that this very useful appendage to a Farm Yard is becoming more common: to which it is hoped, that the Premium lately granted to William Shepherd, Implement-maker of Woburn in Bedfordshire, for a simple portable machine, described and drawn in the First Part of vol. VII. p. 115, of the Board's Communications, will materially contribute. The Board will not, I hope, overlook the encouragement of public Agricultural Weighing Engines, which I have recommended in a Paper on Oak Bark, in the Second Part of vol. VII. of Communications.

The makers of Weighing Engines in and near Derbyshire, whom I heard mentioned, are,

Mr. Thomas Basset of Mathfield, Staffordshire, near Ashburne.
The late Mr. James Bown of Matlock.
The Butterley Company, of Butterley Furnace, near Pentrich.

At the latter place they make the Weigh-bridge, on to which Waggons and Carts are drawn, of Cast Iron, in one piece: at Donisthorpe Colliery in Measham I saw one of these iron Weighing Engines in use.

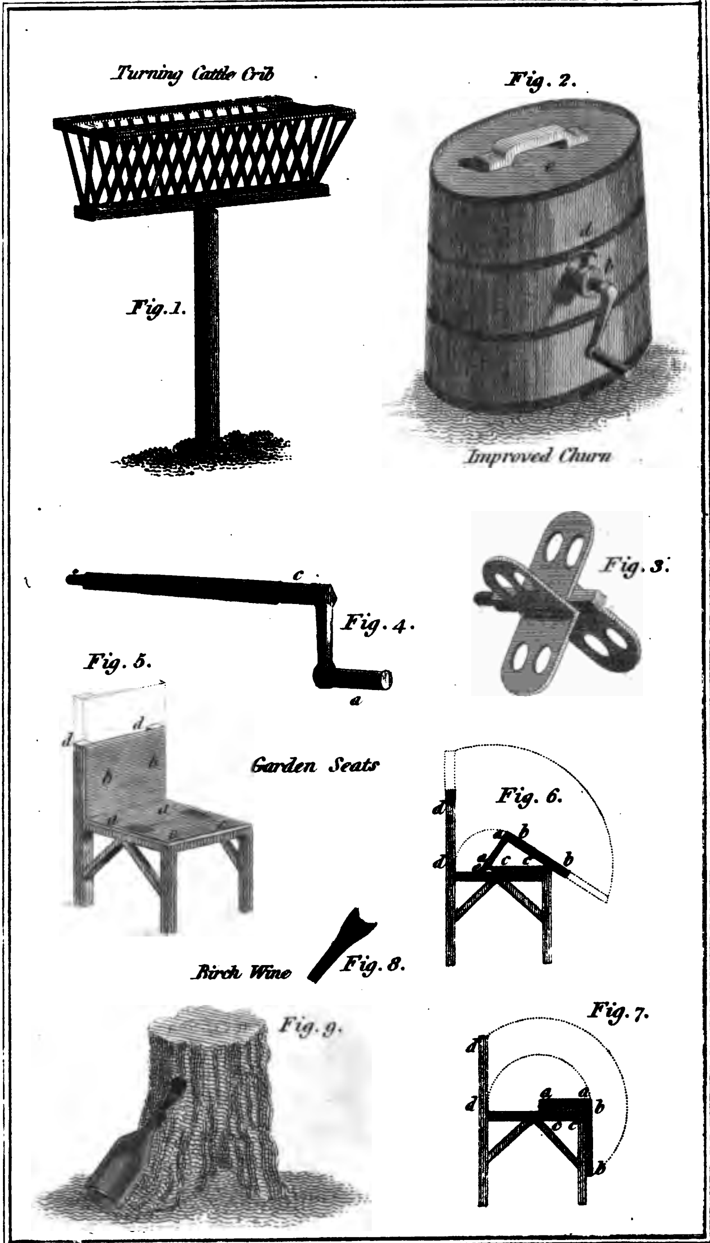
A simple kind of *balance*, improperly called a Steelyard, for weighing Sacks of Flour, Corn, &c. is made by Mr. William Atkins of Caton in Lullington, and by Mr. Wm. Fletcher of Linton in Church Gresley; an ash beam, has a thin saw-like plate let into its top edge, for the weight to hang on, the figures being stampt in or painted on the wood, a half cylindrical case of strong

ash lattice, is suspended from the short end of the beam, to set the sacks into, in a vertical position. I was informed, that these Steel-yards have got into very general use in the Corn Mills, whose occupiers are required by law to keep *weights and scales* therein: and I could not but observe, that the spirit as well as the letter of the law was violated, by substituting these wooden steel-yards, the fulcrum of which is near three inches out of the straight line joining the bottoms of the notches on which the weight hangs, and the centre on which the sack-scale is suspended: and they are consequently incapable of a stable equilibrium, or of deliberate balancing like a pair of Scales, with equal arms and *the centers of bearing in an exact straight line:* a condition in all kinds of balances, which ought to be strictly enforced by Law, and then Steel-yards might safely be admitted as substitutes for Scales and Weights, under proper regulations, for their periodical examination by standard weights.

## SECT. XXI.—MISCELLANEOUS IMPLEMENTS AND TOOLS.

In the weeding of Corn, strong Weeding-Scissars, with handles 2½ feet long are used, for clipping off the weeds close to or rather within the ground: I saw them in use about Whaley-bridge. At Ash in Sutton-on-the-Hill, a kind of *Weeding-Tongs* or Pincers, with fluted jaws, and handles 2½ feet long, are used, for drawing up Thistles, May-weed, &c., from among the Corn in the Spring.

In volume I. p. 432, I have mentioned four Quarries where posts and caps for supporting of *Rick-stands,*




Joseph Farey delin. Neele Sc. Strand

*stands*, are made for sale: and have here further to state, that at Overton in Ashover and at Beeley, I saw stone bearers, cleaved out of the 1st Grit Rock, laid on such kind of stone posts and caps, and forming most substantial and durable Brandricks. On Mr. Benjamin Chambers' Farm at Hurst in Tibshelf, square solid masses of stone are built up and roofed, very flat, with paving stone, which projects over on all sides, and on these, his Corn Ricks are built: at Butterley Hall Mr. William Jessop has square walled, coped and paved rick-stands, such as are in use at Woburn, Beds, and are described and drawn in the Communications to the Board, vol. I. p. 72: Mr. John Holland of Barton Fields in Barton Blount, has similar ones, except that his walled stands are not paved, but he lays rough wood in the bottom to keep the Corn from contact with the ground: he is very careful to cut the sides of his ricks very exact and smooth to the coping of the walls, that vermin may not be able to jump, and catch on loose straw, projecting over.

Mr. Henry Smith, of Norris Hill, near Ashby Wolds Leicestershire, has cast-iron stands to his rick frames, round, 2 ft. 2 in. high, with circular caps 12 inches diameter, and bases eight inches diameter, resting on stones let into the ground. The fluted posts for this purpose (such as Mr. Robert Salmon of Woburn, has lately introduced into the Rick-yard at Woburn Park-Farm), can be made much lighter, and equally strong, with these round posts, and therefore are preferable. Mr. Smith's Farm being on a very tenacious clay of the Coal-measures, he had it effectually under-drained previous to erecting his Rick-stands: a very judicious precaution.

In the yards of Mr. John Shirrat of Mammerton in Longford, and of Mr. William Clarke of Walls in Whitwell,

Whitwell, I saw several *Cattle-Cribs* mounted on Posts, set upright, which turned round on a Pin, so that when the Cattle had well trodden the litter on the two opposite sides, in standing to eat from the Crib, it is turned half round, for them to tread, and dung, and stale, &c. in the opposite directions: I have given a representation of one of these Cribs in fig. 1, of Plate IV. facing page 67.

The use of *Turnip-slicers* is becoming pretty general in the County, particularly by those who cultivate Swedish Turnips, whose close and hard Bulbs require dividing, for some stock to thrive upon them: I noted their use on the Farms of Edward Coke, Esq. at Longford, Mr. Robert Charles Greaves of Ingleby, Mr. Thomas Harvey of Hoon Hay, Mr. Thomas Hassall of Hartshorn, Mr. William Smith of Foremarke Park; Sir Robert Wilmot of Chaddesden, &c. As makers of these Implements for sale, I noted, Peter Bamford of Repton, and Messrs. Hanford and Davenport of Hathern Turn, Leicestershire.

The *Churns* which I saw in the Dairies in Derbyshire, seemed well contrived, and kept in excellent order: the following makers of improved Churns were mentioned to me, viz. Mr. John Coates, cooper, of Yolgrave; Mr. James Fox of Bridge Gate St. Alkmund, Derby, and Mr. Edward Harlam of Wirksworth. The Churns which I saw at Bache Thornhill's, Esq. at Stanton in the Peak, and at the Earl of Chesterfields at Bradby Park, I have represented in Plate IV. fig. 2; they consist of a Tub in the form of the frustum of an Elliptical Cone, with a bottom not plane, but forming the segment of a circle, that it may apply the closer to the Beaters, which consist of four Elliptical Boards, fig. 3, joined together, and nearly fitting the

inside of the Churn, and having an iron spindle, fig. 4, pass thro' a socket in them: the spindle to which the winch Handle *a*, for working the Churn, is fixed, passes thro' a long socket *b*, outside the Churn, thro' the Beaters, and into another socket fixed within the opposite side: the spindle has a deep groove *c*, turned in it, into which the point of a Thumb-screw *d*, enters, and prevents the spindle drawing out, when the Churn is in use, and yet allows it to turn freely: when this Screw is taken out and the spindle withdrawn, the Beaters can be taken out, and they as well as the tub, can be scowered and scalded, with the utmost ease: the top *e*, fits into a groove, and is made tight by a cloth that is shut down in the joint. Mr. Thornhill's Churn, holding about 16 gallons, had four iron hoops, and two iron handles: and on different occasions, churned from 1½ to 20lb. of Butter, in an effective manner: it was made by Mr. Coates, and cost Two Guineas: and appeared to me, to be a most complete implement, worthy of general adoption.

Before I close this Miscellaneous Section on Implements, &c. it may be worth recording, that 50 or 60 years ago, Edward Wagstaff, a Lime-burner at Ashover, contrived a set of rods, each about three feet long and 1¼ inch diameter, having an iron ferril at one end, which projected an inch and a half or more, into which the smaller end of another of these rods loosely fitted, and was kept from drawing out, by a short strap nailed on to one rod and a buckle on to the other: to the uppermost of these rods, when several were thus joined, he fixed a bunch of Holly twigs, and used, during each winter, and occasionally at other times (when Lime-burning was suspended) to employ himself in Sweeping Chimnies, with this simple *Chimney-sweep-*

*ing Machine*; he charged 6*d*. per chimney, and until his death, about 20 years ago, rendered climbing boys unnecessary; and such were not then employed, in the neighbourhood; his Son continued for some years to use his machines, after his death, but neglecting it rather, in favour of his Lime-burning, the common Chimney climbers were called in, and increased by degrees, until at length he gave it up altogether: and when I was at Somercotes Furnace, near Alfreton, I found him there, burning Ironstone for the Furnace.

CHAP.

# CHAP. VI.

## INCLOSING.

### SECT. I.—CASES BY ACT OF PARLIAMENT.

THE following List will shew, that *Inclosures* have been very numerous in the County of Derby, viz.

| | *Acres of Common.* |
|---|---|
| Aldwark in Brassington in 1807 | |
| Alvaston in St. Michael, Derby | |
| Appleby, part of (the remainder in Leicestershire), 40 years ago | |
| Ashford in Bakewell, 1807 | |
| Ashover, 1780 ........ | 3684 |
| Aston, in Hope | |
| Bakewell, 1807 | |
| Bamford, in Hathersage | |
| Barlborough, 1789 .... | 608 |
| Beeley in Bakewell | |
| Beighton ............ | 600 |
| Belper, in Duffield .... | 696 |
| Birchover, in Yolgrave, 1809 | |
| Bolsover ............ | 1592 |
| Bonsal .............. | 1200 |
| Boulton, in St. Michael | 98 |
| Bradburne | |
| Bradwell, in Hope | |
| Brand, in Hartington | |
| Brassington, 1807 | |
| Burnaston* | |
| Buxton, in Bakewell, Hartington and Hope | 909 |
| Callow, in Wirksworth | |
| Chaddesden .......... | 211 |
| Chellaston | |
| Chelmerton, in Bakewell | |
| Chilcote, part of (the remainder in Staffordshire, I. p. 1, Note) | |
| Church Broughton | |
| Codnor in Heanor | |
| Cole-Aston, in Dronfield | |
| Crich ............... | 200 |
| Dale-Abbey | |
| Darley in the Dale .... | 2119 |
| Dore, in Dronfield, 1810 | |
| Doveridge, 1791 | |
| Duckmanton (Long) | |

* This I suppose to be the place called Cunaston, and said to be inclosed in 1789, in the "General Report on Inclosures," p. 235.

| | Acres of Common. |
|---|---|
| Duffield | |
| Eckington | 980 |
| Egglington | |
| Elton, in Yolgrave, 1809 | |
| Elvaston | |
| Etwall, 1797 | 834 |
| Fairfield, in Hope | |
| Ferneylee, in Hope | |
| Findern, in Mickleover | |
| Flagg, in Bakewell | |
| Foolow, in Eyam | |
| Great Hucklow, in Hope | |
| Great Longsdon, in Bakewell, 1810 | |
| Hare Hill, in Boylstone | |
| Hartington | |
| Hartshorn | 850 |
| Hasland, in Chesterfield | |
| Hathersage, 1810 | |
| Hatton, in Marston on Dove | |
| Hayfield, in Glossop | |
| Heage, in Duffield | |
| Heanor | 500 |
| Hilton, in Marston on Dove | |
| Hognaston, in Ashburne, 1774 | |
| Holbrook, in Duffield | |
| Holloway, in Crich, 1771 | |
| Hope | |
| Horsley | |
| Hulland Ward, 1773 | |
| Ible, in Wirksworth | |
| Ilkeston, 1794 | |
| Killamarsh, in Eckington | 242 |
| Kirk Ireton, 1805 | |
| Lea, in Ashover, Crich and South Winfield, 1777 | |
| Little Hallam, in Ilkeston, 1796 | |
| Little Hucklow, in Hope | |
| Little Longsdon, in Bakewell, 1810 | |
| Little Norton, in Norton | |
| Little Wilne, 1763 | |
| Litton, in Tideswell | |
| Locko, in Spondon | |
| Marston Montgomery (page 35) | 80 |
| Matlock, 1780 | 1719 |
| Melborne, 1787 | |
| Micleover | |
| Monyash, in Bakewell | |
| Morley | 500 |
| Morton | |
| North Winfield | 556 |
| Norton | |
| Oakerthorpe, in South Winfield | |
| Ockbrook, 1772 | |
| Osmaston in Brailsford | |
| Packington, part of (the remainder in Leicestershire) | |
| Palterston, in Scarcliff | |
| Parwich, in Ashburne | 927 |
| Pentrich | |
| Repton, 1766 | 636 |
| Sawley, 1787 | |
| Scarcliff (more than 80 years ago) | |
| Sheldon, in Bakewell | |
| Shirland, 1777 | 232 |

Smalley,

| | Acres of Common. |
|---|---|
| Smalley, in Morley | |
| South Normanton, 1768 | 250 |
| South Winfield, 1786 | 251 |
| Spondon, 1788 | 471 |
| Stanley, in Spondon | 82 |
| Stanton by Dale | 103 |
| Stanton in the Peak, in Yolgrave, 1809 | |
| Stapenhill | 100 |
| Staveley | 82 |
| Stoney-Middleton | 368 |
| Stretton, in Shirland and North Winfield 1777 | |
| Sutton, in Scarsdale | |
| Swarkestone | |
| Synfin, in Barrow | |
| Taddington, in Bakewell | |
| Temple Normanton, in Eckington | |
| Thornhill in Hope | |
| Tibshelf | 330 |
| Tideswell, 1808 | |
| Walton, in Chesterfield | |
| Wardlow, in Bakewell, 1810 | |
| West Hallam | |
| Weston Underwood, in Mugginton, 1786 | |
| Willington | |
| Windley, in Duffield | |
| Windmill-houses, in Hope | |
| Winster in Yolgrave | |
| Wirksworth | |
| Wormhill, in Tideswell | |

Scarcliff and Palterton was mentioned to me, as the first Parliamentary Inclosure in this part of England. On the Coal-measures in Palterton, Earl Bathurst, a few years ago, felled many fine Oaks, from the Hedge Rows, which were planted about 80 years preceding; and where, as well as in Scarcliff, on the Yellow Lime, there is now a fine produce of hedge-row Timber, well preserved and attended to, by Mr. James Dowland, his Lordship's Agent.

Many of the particulars of Dates and Acres of Common in the above List, are taken from the "General Report on Inclosures," pages 187 and 234, printed in 1808: wherein it is stated (p. 293) that the number of Acts obtained for Inclosures in this County, from the 1st of Queen Anne to 1797, was 74; of which, 63 Acts stated the quantities to be inclosed thereby, to amount together to 54,985 acres: and at page 295 it is said, that

that 69 Acts for Inclosures in this County passed, in the first Forty years of the present Reign.

In that part of the said Report, which traces the effects of Inclosures, from the Returns made by the Officiating Clergy of 47 places in this County (p. 296) in the beginning of 1801, to the Requisition of the House of Commons, it is stated (p. 229), that the quantity of *wheat* cultivated in 44 newly inclosed places in this County, was 37,154 acres; and (page 230), that in places where 2301 acres of wheat were cultivated previous to inclosing, 2312 acres were cultivated afterwards; which is improperly called an increase of 911 acres, that seemed to result from the measure: the particulars of 13 of these places is stated (p. 234) as follows, viz.

| | | *Decrease of Acres of Wheat.* | *Increase of Acres of Wheat.* |
|---|---|---|---|
| Burnaston (Cunaston) inclosed in | 1789 | 15 | |
| Doveridge | 1791 | 20 | |
| Etwall | 1797 | 85 | |
| Ilkeston | 1794 | | 15 |
| Little Wilne | 1763 | 35 | |
| Melborne | 1787 | 10 | |
| Ockbrook | 1772 | 40 | |
| Repton | 1766 | | 20 |
| Sawley | 1787 | 40 | |
| Shirland | 1777 | | 25 |
| South Normanton | 1768 | 42 | |
| Spondon | 1788 | 28 | |
| Weston Underwood | 1786 | 30 | |
| | | 345 | 60 |
| | | 60 | |
| | | 285 decrease | |

of acres of wheat; and which places could not therefore, have been fairly selected.

At

At page 253 it is stated, that in the Returns of 24 places newly inclosed, where the cultivation of *Barley* is mentioned, 12 of them state an increase, six a decrease of acres of this crop, and six that no perceptible alteration has taken place: of 29 Returns which notice the cultivation of *Oats*, 25 state an increase, two a decrease, and two others that the Inclosure has not altered the acres of this Grain, cultivated annually: and of 19 Returns which mention *Pulse*, four state an increase, eight a decrease, and seven that no alteration has taken place.

At page 255 it is stated, that the cultivation of *Potatoes* has increased in twelve places in consequence of their Inclosures; such increase on the average of thirteen places (page 262) being in the ratio of 75 to 20. It is also stated, that the culture of *Turnips* had increased in five places; the smallness of which number, out of the whole 47 Returns (as well as of Potatoes), could have arisen only from the omissions of the Reporters.

At page 254 it is stated, respecting 19 inclosed places, that *Sheep* had increased in 12, decreased in 5, and neither increased or decreased in 2 places: that of *Cattle* in 19 places, there had been increases in 15, decreases in 2, and 2 not altered: and of 17 places where *Dairies* are noticed in the Returns, 16 are said to be increased, and one unaltered: it being calculated (p. 257), that on the average of 13 places, the increase in the produce of Cheese and Butter in the Dairies of inclosed parishes, had increased as 28 to 20 in quantity.

In the course of my Survey, I heard none of those complaints, of *injury* done to the *Poor* by Inclosures, which have been so industriously sought for in

in the Southern Counties: complaints which, I am satisfied, have rarely any foundation in justice or reason, and that a proper prudence in the enquirer would have discovered, in most instances, that it was not the complaints of the *owner* of a Cottage or Common-right, who had lost the same, and with it his Cow, that he was listening to, but of some *tenant at will*, formerly, to a Cottage having right of Common, for which he paid little or nothing, owing either to the owner's goodness and forbearance, or to not being in a condition, or finding it convenient to stock the Common himself, or herself. It will I am sure be found, that the *owners* of Cottage-rights have received, in general, their full share (and much more in numerous instances) of the Commons and Lands subject to common-right, with the Land-owners: and if it be too generally true, that the Cottager's Allotment is sold at or soon after an Inclosure, and its produce soon dissipated, the cause should be sought for, in that fruitful source of evils, the Poor Laws.

I lament to see, that the phantoms, of Cottagers' keeping Cows and occupying Land, &c. have possessed some men's imaginations, to an extent, which makes them overlook some of the most essential points of justice, and the principle, which is the very foundation of society, the inviolable right of property.—Seeing, as I rode thro' all the modernly inclosed Parishes in Derbyshire or near it, the small allotments, in general, under Garden Culture, and frequently subdividing and fresh Cottages erecting on them, with great appearance of comfort throughout, compared with the Cottages and the condition of their Occupiers, on the skirts of the few Commons which yet remain, I did not stop to enquire

quire in the first instance, whether the Occupiers or their Predecessors, formerly, or now in the latter case, kept Cows, Sheep, &c., or whether the Allotment in lieu of Common Rights had changed hands, or wish for a Law, that should restrain them from so doing, any more than for one which should restrain me and others in my class and above it, from doing what we please with *our own*.

There cannot remain a doubt, but Inclosures have been and continue to be highly beneficial, in *every point of view*, and if any thing is to be regretted concerning them, in Derbyshire, it is, the neglect of agreeing with the Tithe Owner in many instances, particularly in the northern part of the County, as mentioned page 31; and omitting to allot or exchange the small portions of common or demesne Fields, in Parishes, where the inclosing of the large Commons and Wastes, were alone attended to, as in Ashover, Bonsal, Ible, Matlock, &c., where the Fields near the Villages, are still belonging to various Persons, in strips like a common Field: and I heard of an instance, of a second Act of Parliament for remedying this strange oversight in the first one.

The only *Open Arable Fields* now remaining in the County, I believe, are the following, viz.

Bredsall, the southern part on Red Marl, the remainder on Coal-measures.
Dalbury Lees in Dalbury, on Red Marl.
Hollington, in Longford, on Red Marl.
Langley (Kirk), on Red Marl.
Little Chester, in St. Alkmund, on Red Marl.
Little Eaton, in ditto, on Coal-measures.

Roston

Roston in Norbury (and Common Meadows by the Dove), on Red Marl.
Shirley, on Red Marl.
Smithsby, on Red Clay, in the Coal-measures.
Snelston, in Norbury, on Red Marl.
Stenston in Barrow, on Red Marl.
Whittington, on Coal-measures.
Whitwell *, on Yellow Lime.

None of these are of considerable extent, and many of them must remain in their present open, unproductive, and disgraceful state, (tho' principally on the best stratum in the County, see vol. I., p. 148), until less expensive means can be resorted to, than at present, for effecting their division and allotment. In Hollington it was pointed out to me, that repeated attempts had been made there towards an Inclosure, and Ten Pounds an Acre was offered to be advanced by the Proprietors for the general Expences, but, on calculation, it was found quite insufficient! I shall give a List of the Open *Commons* still remaining, in Sect. 1, of Chap. XI. : and where, in Sect. 2. I shall mention, what has occurred to me, on the conversion or improvement of newly-inclosed Wastes.

In Duckmanton, Temple-Normanton, and some other places, the division was made by consent, and Acts obtained, for confirming the same.

In the Act for the Inclosure of Ashover (1779), the Commissioners were directed, to mark out and describe in their Award, 600 Acres of the best of the Commons, to be subject to immediate Tithes, and the Allotments

* In 1811, notices were given, preparatory to an application for an Act to inclose this Parish.

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on all the remainder of the Commons were declared exempt from Tithes, for the ensuing Seven Years. The Act for Matlock, in the year following, directed, that 350 Acres of the worst of the new Allotments should be exempt from Tithes for Eight Years, and the remainder pay Tithes immediately.

It was stated to me, that the Tithes of Hartington Parish were worth 120*l.* a Year at the most, previous to the Inclosure; yet that the Tithe-owner sold the Allotment made to him in lieu thereof, for 28,000*l.* when ring-fenced: the advance having been calculated at 1280*l.* per annum!

When at Melborne, I purchased of Mr. Thomas Dugmore a large Pamphlet written by him, which details several most extraordinary proceedings of the parties concerned in that Inclosure: some of which, it might perhaps be worth while to guard against the recurrence of, in any revisal of the Act containing the general Clauses in Inclosure Acts.

The history which I heard, of the Inclosure of Ashby Wolds, (near, and indeed within the Circuit of this County, tho' in Leicestershire), appeared to me very extraordinary. In the beginning of the first Year of the Commissioners' acting, they declared the extinction of the Common Rights, and after driving off the Cattle, the Wolds lay entirely unoccupied, while the public Roads were fencing off; and during the next two Years, the Commissioners let the large Fields thus formed, to be either grazed or ploughed, at the option of the Tenants; and 200 Acres were ploughed and cropped a second time with Oats, and the whole produce carried off, by these temporary Tenants, before the Allotments were made; altho', as I was informed, the Valua-

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tion or Qualitying was done in the first Year! the remainder of the money not thus raised, for the general Expences, was obtained by the sale of Allotments. In Brassington, the Commissioners took in ley or joist Cattle on the Common, for Two Years, as will be further noticed in Sect. 2, of Chap. VIII.

The following Gentlemen, resident in or near the County, have acted as Commissioners in the Parliamentary Inclosures in Derbyshire, some of them very repeatedly, and have given very general satisfaction to the Proprietors; some of them as sole Commissioner, Mr. John Nuttall* in particular, viz.

Barker, George, of Darley.
Beighton, John, of Hazlewood-hall.
Bettison, Jonas, of Holmpierpoint, Notts.
Chambers, Benjamin, of Tibshelf.
Dowland, James, of Cuckney, Notts.
Eaton, William (the late), of Sutton-on-the-Hill.
Gauntley, William, sen., of Bakewell.
Gibbons, Jonathan.
Green, James, of Linton Abbey.
Harvey, Robert, of Dunstall, Staffordshire.
Nuttall, John, of Matlock.
Outram, Benjamin, sen. (the late), of Alfreton.
Sandars, John, of Mackworth.
Wyatt, Robert Harvey, of Barton under Needwood, Staffordshire.
Wyatt, Samuel, of Burton on Trent, Staffordshire.

On the *Expences* of Inclosures, I have made but few notes: the estimate for Hollington has been mentioned

* To this Gentleman, and his Son Mr. George Nuttall, I am under the highest obligations, for their able assistance and information.

above:

above: and I was informed, that the expence of 280 acres of Allotment in Kirk Ireton actually amounted to 10*l*. per acre, although there was but one Commissioner employed.

On the *Rise of Rent* by Inclosures, Mr. Brown hazarded a conjecture, in the original 4to. Report, that from a third to a fifth of advance had taken place in the Rentals of inclosed Parishes: in some places, where large Commons of useful Land have been brought into cultivation, which before yielded little, I doubt not but the Rental has been doubled, or more.

Before I close this Section, it may be right, to state a few particulars, respecting the reservation and adjustment of *Mineral Rights* on Inclosures, in addition to what is mentioned respecting Brassington, vol. I., p. 406.

In Hartington Act, the Coal, Ironstone, and all other Minerals, except Lead Ore (which belongs to the Crown), in the new Allotments, is reserved to the Lord of the Manor, who is to pay the damage occasioned to the Occupiers by his Mines, assessed by arbitration; which is not an unusual provision.

In Ilkeston Act (1794), the Coal, Ironstone, and other Minerals under the new Allotments, and the right of sinking Pits and Shafts, making Soughs and Drains, Stacking, Coaking, taking and carrying away all such Coals and other Minerals, and all necessary Roads and Ways for such purposes, are reserved to the Lord of the Manor, without any compensation whatever, (because he was subject to none such on the Common). And it is provided, that when damage is done to any Allotment by the Lord's Mining, on notice given in the Church, all the other Proprietors of Allotments are to appoint one Arbitrator, and the injured Person another, who are to ascertain the damage, and assess a rate on

all the Proprietors of Allotments, according to a Schedule to be set forth in the Award, by the Commissioners, of the value of each and every Allotment, for raising such compensation. On the contrary, in Heanor Inclosure, the Commissioners made a specific Allotment to the Lord of the Manor, for the estimated damage to be done, by the getting of his Coals and other Minerals, and he is made liable to compensate the owners or occupiers of Allotments, for all the damage his Mining may occasion.

In Stretton Act (1777), the Mines of Coals and other Minerals in the Allotments, are reserved to the Lord of the Manor, on paying for all damage done by the getting of them, by Arbitration: and it is provided, that Pits, Shafts, Holes, or Hills of Rubbish, or Roads disused for Twelve Months, on the Allotments, may be levelled by the owners of them, and the expences are to be repaid by the Lord of the Manor: and it is enacted, that no Land shall be again "entered and broke up, under pretence of getting Coal, after the same shall have been once worked, cleaned, and levelled, as aforesaid." It is easy to see, that under the last provision, the Lord may be deprived of deep Seams of Coal, that may hereafter become very valuable, and without their becoming the property of any one else. In Barlborough, previous to the Inclosure, the Coals, &c. in the old Inclosures, and in the Common Arable Fields, belonged to the owners of the individual lands: and the Act made no provision for valuing and transferring the Minerals along with the Allotments, but simply reserved every Person's Minerals, by which, besides the Owner of a Field, there is now as many Coal Owners in it, as formerly it had single Lands, almost, in the common Fields! and scarcely any persons are able to get or

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avail themselves of their Coals, in these Allotments, owing to these intermixtures.

Roads and Paths will be spoken of in Sect. 1, of Chap. XVI., and Public Drains in Sect. 1, of Chap. XII.

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## SECT. II.—FENCES.

In setting out the new-inclosed Fields, less attention has sometimes been paid, to making them divide the different Soils, than ought to have been. At Kidsley Park in Smalley, I observed, that tho' the Fields had, in general, parallel and equal opposite sides, yet they formed very acute lozenges instead of rectangles. The smallness of Inclosures in some parts of this County have attracted the notice of observers, who have, after describing them, as consisting of four or five-acre Fields, inconsiderately asserted, that "*one-sixth* part of the profitable Land is thus lost in Fences;" it may not therefore be amiss to state, that supposing each five-acre Field fenced on three sides, in order to allow amply for Fences against Roads and irregular Fields, and allowing twelve links or eight feet wide for a hedge and ditch, the quantity of Land so occupied is but 39 perches, or *one-twentieth* part of the Field; and if the Fences are Walls, as is general in the Districts alluded to, occupying or spoiling not more than four links wide, the quantity of Land thus lost is but *one-sixtieth* part of the whole! A very undue prejudice seems entertained by Mr. William Pitt, in the Staffordshire Report, page 192, &c., and by many others, against Stone *Wall Fences*, demanding Hedges in their room, as more conducive to beauty as well as shelter; now,

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in viewing agricultural and rural improvements, such as are most effective and adapted to their uses, have ever appeared to me as the most beautiful: and, that Stone Walls are best adapted to the situations where they are generally found, won't long be disputed by those who enter deeply enough into the subject to entitle them to give an opinion, I am pretty confident. In all situations where Stone Walls abound, we may be certain that stone is procurable with little labour, on or near the spot; and in many instances, the surface was so incumbered with large loose blocks of stone, that till, for this and other purposes, they were broken up and removed, cultivation was impracticable. A Wall Fence is no sooner finished, than the full benefit of it is reaped, either for the protection of Crops or Shelter; whereas in planting Hedges, Wood must be procured, from great distances often, to protect the young fences, and constant care and expence in weeding, &c. must be incurred, for several years, before any benefit is derived from the Hedge: and often, after years of struggling against Nature, in attempts to raise Hedges, where Walls ought to have been made, the same are forced at last to be resorted to, as will be the case ultimately, I apprehend, on Bramley Moor in Eckington, where, tho' excellent Stone abounds, beauty, or some other equally weighty motive, dictated, quick Fences instead of Walls. On Bakewell Moor, I saw two low Stone Walls, raised at a distance from each other, in order to plant a Quick between them; the whole perfectly inadequate as a Fence, and long likely to remain so.

Wall Fences, in the Peak Hundreds, are usually built dry, or without mortar (of uncoursed rubble, as the Masons would term it), five feet high, with a nine-inch coping of stones on edge, on them, for Boundaries; and four

four feet and a half, and a nine-inch coping, for interval Fences; the cost from 6*s*. to 10*s*. and 12*s*. per rood, of seven yards in length, for getting the stone, carting, and building the Wall. In Over Haddon, seven quarters and two inches, or five feet five-inch Walls cost 7*s*. to 9*s*. per rood. In Brassington, five feet two-inch Walls, cost 6*s*. per rood; the stone being good and near at hand. At Blackwell near Taddington, Walls six feet high cost 8*s*. per rood; sometimes the Farmer finds a horse and cart besides, to prevent the Wallers digging holes in improper places in the Fields. On Stanton Moor, near Weaver Hills, in Staffordshire, the Walls are constructed by stones piled or set almost upright (like the copings of Walls) instead of being laid flat. In Ashover, Beeley, and some other places, I saw long straight stones, cleaved from the loose blocks of Millstone Grit, and set upright in the ground, as pales, touching each other, and forming the most durable and complete Fence.

In the Building of Walls between Fields, holes are often left, large enough for Sheep to pass through, and are closed afterwards by a flat stone, set up against them; which can be removed, whenever the Sheep, but not the Cattle, are intended to have the range of two Fields; a practice which Mr. Joseph Gould of Pilsbury often avails himself of in stocking his Pastures, which could not well be done with Hedge Fences.

In several modern Inclosures, as Brassington, Great Hucklow, Norton, Wirksworth, Needwood Forest in Staffordshire, &c., the *Ditches* of Quick Fences have been ordered, by the Commissioners, to be made *inside* the Fields, next to the Roads: which I observed to be very common in the N W part of Norfolk, and seemed a very good practice, where loose Cattle are very

carefully excluded from the Roads; otherwise such, when forced by hunger, would certainly break through such Hedges into the Fields.

It was pointed out to me, that Quicks were raised in the Norfolk method at Longford and at Barton-Lodge; but I found, on inspecting them, that only the deep Ditches and bank-set Quicks of Norfolk had been imitated, but not the principal peculiarity of that County, that of plastering the whole surface of the Bank with tempered dead earth from the bottom of the Ditch, devoid of the seeds of weeds, in order to prevent the seed of weeds in the Bank from vegetating, (which process I have fully described in the article *Canal*, in Dr. Rees's New Cyclopædia). Mr. John Blackwall, of Blackwall in Kirk Ireton, has used slacked Lime, plastered on to the face of a newly-planted Quick, for the same purpose. Mr. James Dowland, of Cuckney, Notts, mentioned to me, from observing that bank-set Quicks, with a northern aspect, succeeded much better than those with a southern aspect, he had ascertained, that the Winter and early Spring Sun was very prejudicial to young White-thorn Sets, in prematurely exciting them to vegetate, from which those with a northern aspect were free. Mr. George Toplis, of Brassington, prefers buying three-year old Quick-sets, and finds, that these, when carefully taken up, will each furnish three or four cuttings of their long roots, which, if bedded out in a Garden, will grow to Sets, equal to the original ones. I have found old White-thorn Stools effectually renovated by cutting them off below the branching of the roots, so that each root separately threw up its young shoots.

Mr. Francis Blaikie, the Earl of Chesterfield's Bailiff at Bretby, in raising young Quicks, plants them verti-

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cal or foot-set, in a slight excavation of two or three inches deep; the sides sloping down to the Plants in Summer time to conduct the rain-waters to their roots, and in Winter time, the earth is moulded up against them, as against Celery in a Garden, to protect them from the frost: by this alternate gripping and moulding, Mr. B. raises strong Fences against any kind of stock, in six or seven years. At two years old, Mr. B.'s Quicks are cut close off, in March; in the Autumn of the third year, he hogs them up to two feet and a half high, to prevent snow from breaking them; and the fourth year, hogs them up to four feet high. This Gentleman shewed me Hedges of 41 years' growth, the stools of which had been successfully moved, a few years ago, to another situation. A few small Thorns or Briars, laid along the rows of young Quicksets, effectually prevents the depredations of Hares and Rabbits upon them, according to Mr. B.'s "Farmer's Instructor in Planting," &c. p. 11. The young Quicks which I saw on Mr. Edward S. Cox's Farm at Brailsford, were exceeded in perfection by none that I saw, unless it be Mr. Blaikie's: the hoging of whose Hedges, called Tomahawking, is performed every Autumn, with a Scymeter or long-handled Reaping-hook, striking upwards.

Mr. William Cox, of Culland in Brailsford, plants one row of Quick, on the top of the Bank (as Mr. Bakewell did at Dishley), of three or four-year old Plants, and in five years the same comes to be a perfect Fence, in that excellent soil.

About Ashburne, the Hedges are neatly clipt next the Roads, and between the Fields, also at Bretby and at Ingleby, &c.: by the Towing-Paths of the Cromford,

 Derby,

Derby, and Trent and Mersey Canals, the Hedges are neatly clipt.

The great enemies to good Hedges are Weeds, Woodbind or Honeysuckle *(lonicera periclymenum)*, Wild-Hops *(humulus lupulus)*, Traveller's Joy *(clematis vitalba)*, the Blackberry Bramble, or Briar *(rubus fruticosus)*, and other creepers, which bear them down, and horned Scotch Cattle, which do incredible damage in Ingleby and some other places to the Quicks, by beating them with their horns, (especially where surrounded by Herds, where Cows are going to Bull), as soon as they begin to thrive, in fenced pastures, which they have not been used to, on their native Mountains. Mr. Francis Blaikie has found, that fresh Cow dung spread on the bank, where the Scots have begun this mischief, will occasion them to desist, and leave that place. Deer will in like manner often, beat and damage Hedges, or Bushes, or Gorse, &c. in a Park, with their Horns. The Hedges at Foremarke Park, very strong, of six to ten years growth, are contrived to be cut, a side at a time, when in corn; the expence 1*s*. 6*d*. to 2*s*. per acre, of 32 yards in length.

Nearly all the Hedges which are now planted, are of White-Thorn *(cratægus monogyna)*, and except in the Rocky or Wall-Fence districts, they are pretty well preserved and managed: in these stony districts, the few White-Thorn Hedges which have been planted by the sides of the Walls, are not periodically cut down, and treated as a hedge, but suffered to grow up as dwarf trees and stems, for shelter to the cattle, and ornament; several of these rows of neglected White-Thorns may be seen on the north side of Bonsal, and other places of the Mineral Limestone district.

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The Crab-Tree (*pyrus malus*) is less planted in Hedge rows here than formerly, owing to the destructive effects of Caterpillars on them, and to the mischief Boys occasion in gathering the Crabs. On the south of Derby, there are several Crab hedges found, on the Red Marl: those Farmers who gather their Crabs, send them to persons who keep Rollers and Presses for making Verjuice: John Draper of Synfin Moor-Lane, keeps a pair of fluted rollers for crushing Crabs or Apples, and a long lever press for expressing the juice; which he does for *3d.* per bushel of fruit. William Taylor of Repton has an apparatus similarly employed, in the Fruit season.

Black-thorn (*prunus spinosa*) and Bullace Tree (*prunus insititia*) are never now planted in new Hedges; but are to be found in the old Fences of some districts, as about Sutton on the Hill and Trusley on Red Marl, and Pinxton on the Coal-measures, where I noticed them.

Holly (*ilex aquifolium*) holm or hollin, is less cultivated in Hedges than it ought to be: probably owing to the difficulty of removing the Plants, which some persons effect with better success at Midsummer, than in the Spring; and Mr. James Dowland of Cuckney, Notts, has alike succeeded, by pruning Holly setts a little, and removing them during a severe frost. The Magnesian Lime soils seem to suit this Plant, and I noticed it to thrive in the following places, viz. Ashover, Brampton, Clay-cross in North Winfield, Dale Abbey, Doveridge, Greasley Notts, Greenhill in Norton, Holy-moorside in Chesterfield, Newton in Blackwell, Norton, Plesley, &c. At Rowlee in Hope Woodlands, the sides of the hills were formerly scattered

tered with Holly Pollards, which they used to lop* in severe winters, for the Sheep, with good effect; until these trees were cut down, by an inconsiderate Agent, for the sake of making Charcoal, and Birdlime from the Bark, as is said; and the Sheep, by cropping the young shoots, have since effectually killed all the stools. A great many Holly Pollards grew, in places, on the Red Marl on Needwood Forest, Staffordshire, which were cut down and bark'd on the inclosure of that waste in 1808; William Shird of Draycott, S E of Uttoxeter, purchased a great deal of this Bark, boiled it, laid it in heaps for three or four weeks to ferment, then ground it under a rolling or edge-stone, cased with wood, and then repeatedly washed it by hand, in a running stream of water, to make Birdlime, of which he sold many large casks at 1*s*. per pound, and had a great deal by him, when I was there.

I observed Privet (*ligustrum vulgaris*) to flourish much in the hedges on the yellow Lime, in Bolsover, Clown, Palterton, Plesley, Whitwell, &c.

It was the opinion of Mr. James Pilkington (View of Derbyshire, I. 380) that Barberry (*berberris vulgaris*) caused blight in Wheat, in this County: I met however with no Farmer of this opinion, nor did I see any number of these bushes in the course of my Survey.

Elder of the black-berried kind (*sambucus nigra*) grows in hedge-rows in Whaley, in Bolsover, and other places, and soon effectually destroys more useful hedge-wood, in its vicinity. The white-berried Elder

* In performing this, it was found, that they often died, if the whole of the branches were cut off at once: the lower boughs were therefore left, when the middle ones were cut off.

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(*sambucus alba*) grows in hedges at Mackworth, at Combridge in Rocester, Staffordshire, &c.

Birch (*betula alba*) abounds a good deal, in the Hedges which bound on the Moors or Mountains, that are not calcareous.

Alder (*betula alnus*) is also found in similar situations, and of late, the Bark has turned to good account for dying, of which further mention will be made in Sect. 3, of Chap. X.

Sallow (*salix caprea*) is also found in the moor-side Hedges, and the same seems spontaneously to spring up, in poor, pared and burnt lands, on the Limestone, or on the waste heaps of Lime quarries, at Monyash, and at Great-rocks, &c.

Ash (*fraxinus excelsior*); the stems of this wood are apt to spread in the Thorn hedges, and destroy them, and cause gaps, if not attended to: the Mineral Limestone of Derbyshire seems particularly favourable to Ash, as the names of many of its Towns and Villages indicate.

Maple (*acer campestre*) is found in the Hedges, in many places; I noted it in Catton, Croxall, Pinxton, Trusley, &c.

Hazel (*corylus avellana*) is much too common in the hedge-rows of this district, particularly on the yellow Lime, inducing a good deal of trespass on the Farmers, by Nutters. It has been thought by some, that cropping the leaves and buds of the Nut Hazel, by young Beasts, produces the disease called Red Water: see Sect. 1, of Chap. XIV.

Timber Trees in Hedge-rows will be treated of in Sect. 3, of Chap. X.

*Gates.*—In the stony Districts of the County, substantial

stantial Stone Stoops, or Posts for Gates, are in general use: near Bakewell, these Stoops sell at 3*s*. a pair, at the Quarries; at North Anston, in Yorkshire, Stoops eight feet long are sold at 6*s*. each; and at South Anston, Dog-kennel Quarry, (on the Chesterfield Canal, vol. I., p. 420 and 411,) at 5*s*. each. In the Inclosure of Over Haddon, Mr. Isaac Bennet paid 3*s*. a pair for his Posts, at six miles distance, and 19*s*. each for his Oak Gates, with iron-work; iron-work to the Posts, and hanging the Gate, 2*s*. 6*d*. Anciently, the Gates in the Peak Hundreds were formed and hung without any iron-work, even nails, as I have been told; and some yet remain in Birchover and other places, where no iron-work is used in the hanging: a large mortise-hole is made thro' the hanging-post, perpendicular to the plane of the Gate, at about four feet and a half high, into which a stout piece of wood is firmly wedged, and projects about twelve inches before the Post; and in this piece of wood, two augur holes are made, to receive the two ends of a tough piece of green Ash or Sallow, which loosely embraces the top of the head of the Gate (formed to a round), in the bow so formed: the bottom of the head of the Gate is formed to a blunt point, which works in a hole made in a stone, set fast in the ground, close to the face of the Post. It is easy to see, by the mortise-holes in all old Gate-Stoops, that this mode of hanging Gates was once general. A great contrast to these rude Gates, is exhibited, on the Farm of Mr. Thomas Harvey of Hoon Hay, who has four sets of hooks and catches, all adjustible by nuts and screws, fixed in his Gate-Posts, which are very stout, in the line of a private and bridle Road thro' his Farm; so that from whichever quarter the wind may come, in blowing weather, the Gates can readily be shifted, so

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as to be shut too by the wind, instead of being forced open thereby: there is also a screw for adjusting the top thimbles of these Gates, for making them shut more perfectly. In Ingleby, and some other places, I saw hooks to the field Gates, for hanging them either of two ways. Near to Goyte Bridge, in Cheshire, I observed Gates, on the Roads, kept shut by means of swinging poles, suspended from tall posts erected behind the Gates, and jointed to the Gates, in a very simple and effective manner. Near Paniers-pool Bridge, I noticed the Gates kept shut, by a pointed strut pitching in the ground, in the manner of that used to drag after a waggon, and scotch it in going up hill; but these last are intolerable nuisances to persons on horseback.

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## SECT. III.—NEW FARMS.

In consequence of the Inclosures, a great many new and excellent Farms have been laid out: the principal of what I noted on this subject has already been given, in page 9, in speaking of the new and most complete Farm Buildings and Premises.

# CHAP. VII.

## ARABLE LAND.

### SECT. I.—TILLAGE.

*Ploughing*, (see page 43.)—It has been estimated, that so large a portion as four-fifths of the surface, in Derbyshire, is in grass, and one-fifth of it only in aration; but I think it probable, that the proportion of ploughed Lands is greater than this. A considerable partiality seems to have prevailed, with the Farmers of this County, for the use of two-share Ploughs. Mr. Thomas Harvey, of Hoon Hay, with a two-share Plough, drawn by four horses at length, and a boy to drive, ploughs near two acres in a day. Mr. John Pearsall of Foremarke, with five horses and a driver, ploughs about an acre and a half in a day. Mr. Robert Lea of Borough Fields, with five horses and a driver, ploughs an acre and a half of fallow in a day. Mr. Francis Blaikie, Bailiff to Earl Chesterfield, at Bretby, with five horses and a driver, ploughs about an acre and a half in a day.

Formerly, six horses were often employed in ploughing; these have been seen working, at length, in a Field of only three acres extent; a great portion of their time, in such case, being lost in turning.

Of late years, two-horse Ploughs, without a driver, have made considerable progress in the County. Mr. Francis Blaikie at Bretby, with a single-wheeled two-

horse Plough, executes about three roods per day. Mr. Thomas Harvey of Hoon Hay, with two horses a-breast, ploughs near an acre per day. Edward Coke, Esq. of Longford, uses a two-wheeled Warwickshire Plough, and two horses a-breast, without a driver. Mr. Timothy Greenwood of Newhaven, uses two horses a-breast. Mr. Joseph Gould of Pilsbury, with a Rotherham Swing Plough, drawn by two horses a-breast, usually ploughs one to one acre and a quarter per day. Mr. John Lingard, at Great-rocks Lodge, uses a wheeled Plough, drawn by two horses a-breast, except in the most uneven of his Land. On very strong and stubborn Land on Morwood Moor in Crich, I saw two horses employed in ploughing, but unfortunately did not learn, who it was who was setting so excellent an example to his neighbours. On the 23d of August 1810, a bet was decided, on one of Lord Waterpark's Farms in Doveridge, of a Norfolk Plough drawn by two horses, without a driver, against a four-horse Plough of the District, without a driver: the four horses in two hours and a half ploughed almost an acre, the two-horse Plough not quite so much; but from the comparative ease to the horses, and the goodness of the work performed, the decision of the umpires was in favour of the Norfolk Plough.

The use of Oxen in ploughing was very general many years ago, in different parts of the County, in Ashover in particular; but the same was gradually, and at length entirely, discontinued, until of late, that many experimental Farmers have again introduced them on their Farms, as will be further noticed in Sect. 1, of Chap. XIV.

Ploughing, when hired, is usually at the rate of 12*s*.

to 15*s*. per acre, including harrowing, on old tilled Lands, and 18*s*. per acre for breaking up Leys.

The quantity ploughed annually by each Farmer's horse, in this county, is supposed to vary from 15 to 30 acres, and average about 21; and the work of each Ox to average about 13 acres of ploughing.

*Harrowing* and *Rolling* presented nothing worthy of noting, except what will be found at page 45; *Scarifying*, or the use of the Scuffler, is becoming pretty general, as mentioned page 48.

*Ridges* pretty generally prevail on the Derbyshire ploughed Lands, whatever be the nature of the soil, or the declivity of the surface, and they seem about six yards across on the average. In Tissington Park, I noticed some very highly ridged pasture Lands, which are not very common in the County.

The putting in of Crops on once ploughing, is practised by Mr. Timothy Greenwood of Newhaven, Mr. Blaikie of Bretby, and some others: Mr. Joseph Gould of Pilsbury, after trying this method, has returned to his former practice of twice ploughing and harrowing.

*Drilling*, (see p. 46.)—The drilling of Turnips in the Northumberland or Scotch-row method, was lately practised by Mr. Robert Tomlin, Bailiff on the Duke of Devonshire's Farm at Chatsworth, at the distance of 30 inches, hoeing them twice; after which, when the roots were grown to a considerable size, a furrow was turned from each drill, by a light Plough, into a ridge between the rows; which ridge, on the setting in of Winter, was split

split gain by a double-boarded Plough, moulding up the Turnips, so as to preserve them effectually from the frost. Mr. Francis Blaikie, Bailiff to the Earl of Chesterfield at Bradby Park, sows Swedish Turnips in 20-inch rows, in the Scotch-row method, the ground having been previously well pulverised, cleaned, and manured. Norfolk Yellow Turnips are here also drilled, with Cooke's patent machine, after well cleaning and manuring.

Mr. Isaac Bennet of Over Haddon, Mr. Thomas Harvey of Hoon Hay, Mr. William Fearn of Mackey in Sudbury, and others also, drill their Turnip crops.

The drilling of Wheat, Oats, and Barley, is practised by Mr. Francis Blaikie for the Earl of Chesterfield, with Cooke's patent machine. The Rev. Edward Otter of Bolsover Castle, drills his Corn crops. The Rev. Robert Greville of Wyaston drills Oats and Barley; Mr. Robert Stone of Boylstone, stated to me his opinion, from what he had seen in Worcestershire, that the drilling and hand-hoeing of Wheat would certainly answer on the Red Marl Lands of Derbyshire. I have already mentioned, at page 46, that Mr. John Johnson, used, when at Odd-house Farm in Measham, to drill *for hire*; he found a machine, horse, and men, and drilled at 15*d*. per acre for sowing, and 12*d*. per acre horse-hoeing: or, he performed these operations for the sowing of the seed, estimated at one bushel per acre; and I was much pleased to learn, that as soon as his new Union Farm on Ashby Wolds, Leicestershire, is got into order, he means to resume his drilling for hire, in the neighbourhood. Mr. Philip Oakden of Bently-hall drills and hoes his Beans. Mr. Thomas Lea of Stapenhill drills and twice hand-hoes his Beans; three bushels and a half of seed produce three to five quarters

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of Corn. Mr. Edward Brown of Ingleby drills all his Corn, by a Cooke's patent machine; Wheat at twelve inches and five pecks of seed (34 quarts per bushel); Barley at nine inches and nine pecks of seed; Beans at eighteen inches and eight pecks of seed. Mr. Thomas Moore of Lullington, in 1808, drilled five acres of Beans, opening the drills with a spade, and filling the last one at the same time, after the seed had been distributed by hand; the saving of seed one peck per acre, and the cost 19s. per acre, the crop the best in the neighbourhood, or that he ever had. At Chatsworth, Mr. Tomlin drilled his Beans.

The *Dibbling* of Wheat was once performed, for Mr. John Greensmith of Mammerton in Longford, by a Norfolk man, who happened to be at Mr. Coke's, as an experiment against broadcast sowing, in the same field; the broadcast straw was extremely laid before harvest, which the dibbled escaped, and proved the best sample as well as the most abundant crop. Christopher Smith, Bailiff to Edward Coke, Esq. of Longford, regularly practises the dibbling of Wheat on the small portion of arable which he has in occupation; and in this neighbourhood, the dibbling of Beans is general. Thirteen to nine years ago, Joseph Richards (who now lives as Bailiff with Lord Sheffield in Sussex) dibbled several sorts of Grain for Mr. John Walker of Marston Park in Marston Montgomery, but the crops proved weak and thin, and the practice there has been discontinued. Mr. Francis Blaikie, Bailiff to Earl Chesterfield, always dibbles some Corn; Wheat, on a Cloverley once ploughed, and if the ground is very dry at the time, he treads in the seed by a flock of Sheep; Beans he also dibbles, on once ploughing, in rows, at two feet apart,

apart, so as to admit of the single-horse Plough and Hoe between the rows. Mr. William Wallis, Bailiff to the late Mr. Francis Bruckfield at Alton, (formerly Mr. Robert Bakewell's ploughman and driller at Dishley,) dibbled his Beans in rows, twenty-four inches asunder, and two and a half to three inches apart in the rows, one Bean in a hole, about two and a half bushels of seed per acre, the cost 14*s*. per acre, and no Beer; he ploughed between the rows and hand-weeded: the crop, which was most excellent, was pulled up, and after the roots were chopt off, tied with straw-bands. Mr. Rowland Reeves, Bailiff to Sir Robert Wilmot at Chaddesden, dibbles his Beans in twelve-inch rows and one inch and a half apart; the crops excellent. Mr. William Garman of Persal Pits in Croxall, dibbles his Beans.

*Horse-hoeing*, (see page 48.)—The price which Mr. John Johnson used to charge for performing this useful operation *for hire*, was 12*d*. per acre: some other instances of Horse-hoeing which I observed are mentioned above.

*Hand-hoeing*, (see page 61.)—At Bretby, women are employed to hand-hoe drilled Corn, for the Earl of Chesterfield, at 5*s*. per acre, and they are found equally or more expert in the use of the Hoe, than the men. The price of hoeing broadcast Turnips here, is 8*s*. the first time, and 6*s*. the second time, per acre. At Longford, 21*s*. to 23*s*. per acre has been paid for the hoeing of Turnips twice. At Foremarke-Park, Mr. John Hardy, Bailiff to Mr. William Smith, gives 8*s*. for hoeing Turnips the first time, with one gallon of small beer and three pints of ale per man per day.

In Hartington, and other parts of the Peak Hundreds, it has been common, to omit the hoeing of Turnips, under an idea that small and middling sized bulbs, stand the frost so much better than large Turnips.

*Weeding* (see page 66).—The weeds which I observed infesting the Ploughed Lands of Derbyshire, were the following, viz. 1. Arsesmart (*Persicaria hydropiper*) or Lake-weed; this I saw abound in the Bean crops E. of Longford, in Turnips, S. E. of Ash, on Egginton Heath, &c. 2. Black Twitch (*avena elatior*), Kessell or two bulbed grass, this I noticed in the lands lately occupied by Mr. Thomas Logan at Buxton, at Blackwell, Foremarke-Park, &c. 3. Carlock (*sinapis nigra*) Wild Mustard or Ketlock; this I observed in Turnips at Donisthorpe, at Appleby, at Killis in Horsley, &c. good fallowing can alone eradicate this weed, when once it has gained possession. 4. Carrots, wild (*daucus carota*); this weed I noticed in Hollington N.W. Spondon, Great Wilne, Walton on Trent, Edingale, &c. 5. Chickweed (*alsine media*), this I observed in Turnips at Bretby, at Bakewell, at Newhaven, Pilsbury, &c. 6. Cockle (*agrostemma githago*) or Corn rose, in Barley at Foremarke, &c. 7. Coltsfoot (*tussilago farfara*) or Cleats, at Buxton, &c. It seems true, I think, that this weed invariably appears on lands over ploughed and cropped: where its double mode of propagation by roots, and light winged seeds, soon occasions its rapid increase. 8. Convolvulus (*convolvulus arvensis*) or Bind-weed, in Wheat at Hollington, &c. 9. Darnel (*lolium temulentum*) in Wheat at Foremarke-Park, Waldley, &c. 10. Docks (*rumex crispus*) in Wheat at Hare Hill in Boylstone,

Boylstone, Buxton, &c. 11. Fat Hen (*chenopodium viride* or *serotinum*) or Wild Spinnach, in Killamarsh highmoor, &c. 12. Marigold (*chrysanthemum segetum*) in Glossop, &c. 13. May-weed (*anthemis cotula*) white Yarrow, Dog's fennel or Dog-daisey, in Wheat, Beans, &c. at Hollington, at Killis, &c. 14. Needle-weed (*scandix pecten*) or Crow-needle, in Corn at Hoon Hay, &c. 15 Oats, wild (*avena fatua*) in various places. 16. Popies (*papaver rhœas*) in Corn at Chaddesden, Osmaston, Beighton, &c. 17. Sorrel (*rumex acetosa*) on poor or exhausted Grit-stone soils. 18. Thistles (*serratula arvensis*) in Bredsall common field, &c. &c.* 18. Twitch (*triticum repens*) or Couch-grass, at Buxton, Horsley, Killis, &c. &c.: this troublesome weed, is in many situations propagated by its *seeds*, as fast as by its roots, tho' unnoticed by the Farmer.

The above is by no means offered as a complete list of the Weeds infesting the Arable Lands of this County, much less do I pretend to mention all the places where they most abound, or imply, that in some other situations they do not more prevail, than in those which I happened to minute, as above; the different seasons of the year in which I necessarily visited different places, prevented the noticing many things of this nature, which probably were very observable at a different season.

* The prevalence of this weed, is justly the reproach of the Farmers of a great part of the County. At Gateford in Nottinghamshire, a Tenant under notice to Quit, in dudgeon, let his Thistles grow, to annoy the surrounding Farms, and actually refused five Guineas, offered by one of his Neighbours, for permission to enter and cut them down, before seeding.

## SECT. II.—FALLOWING.

The system of periodically fallowing Land, which many have been disposed to decry, is still much adhered to in Derbyshire, tho' the number of naked fallows are now comparatively few, Turnips, Cabbages, and other green crops, having become pretty universal on the fallows. Mr. John Webb of Barton-Blount Lodge, considers fallowing superior to any other system of management on the Red Marl, even if clean. Mr. William Smith of Foremarke-Park, is also a steady advocate for this process. On the Coal-measures about Alfreton, Mr. W. Jessop, jun. estimates, that every fifth field of Arable Land is fallowed each year.

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## SECT. III.—COURSES OF CROPS.

In order to classify my several notes, respecting the courses of Crops pursued in the County, I have considered them under three heads, first, such as have no Green Crop in them; second, those which have no successive Corn Crops; and third, such as have successive Corn Crops before or after the Green Crops, and shall treat of them in that order.

*First*, In the Common or Mesne fields of Hollington, the course of cropping is, 1. Fallow, 2. Wheat, and 3. Beans or Oats; this also was the course on part of Mr. John Webb's Farm at Barton Lodge, until about 1802, and still is on many Farms in Sutton on the Hill. Mr. William Greaves, jun. of Bakewell, crops thus, 1. Fal-

1. Fallow, 2. Wheat, and 3. Oats, or on the lighter parts of his Farm, on 1st Limestone, 1. Fallow and Turnips, 2. Oats, and 3. Wheat, and finds the Wheat crops better in the second course, than in the first: Mr. Samuel Eyre of Radburne, 1. Fallow (on Red Marl formerly much marled) with 96 bushels of Turnditch Lime (1½ loads) per acre; 2. Wheat, and 3. Oats on part, and Beans on the remainder.

The course of cropping followed by Mr. Joseph Gilbert, Bailiff to Bache Thornhill, Esq. of Stanton in the Peak, is, 1. Fallow, 2. Wheat, 3. Oats, and 4. Beans; or on the more clayey parts of his Farm, 1. Fallow, 2. Wheat, 3. Beans, and 4. Oats.

Mr. Isaac Bennet, jun. of Over Haddon, has 1. Fallow, limed with 150 bushels per acre; 2. Wheat, 3. Oats, and 4. Oats. In a district where such courses as the three last are tolerated, I was not surprised to hear, that some Tenants to the ancient Park at Haddon, had, since it was disparked and let, reaped six or seven white strawed Crops, in immediate succession! the Tenants maintaining, as I was told, that the thick crops they got, smothered all the weeds, and rendered a Fallow, or Green Crops unnecessary! In Barlborough common field, on the yellow Lime, I heard of seven successive Crops of Corn having been taken. As a contrast, I have in my next or *Second* Class to mention, the practice of Francis N. C. Mundy, Esq. of Markeaton, who has, 1. Fallow and Swede Turnips, 2. Barley (and Red Clover), and 3. Clover: the reason, however, with Mr. M. for adopting this Course, is to obtain as much Clover as possible for his Stock; and as might be expected, the Turnips, Barley, and Clover, all prove most abundant Crops.

Mr. Thomas Bowyer of Waldley, has, 1. Fallow,

 2. Wheat

2. Wheat or Beans (and red Clover-seed); 3. Clover, and 4. Oats or Beans.

Mr. Thomas Harvey of Hoon Hay, 1. Fallow and Turnips, 2. Barley, or Spring Wheat and Seeds (viz. White Clover 4lb., Red Clover 8lb., Rye-grass half a bushel per acre); 3. Seeds, and 4. Oats. Mr. H. finds Spring Wheat more favourable to the sowing of Grass-seeds, than Barley, and not so apt to smother the young seeds. In cleaning land which was very foul with Twitch-grass, Mr. H. fallowed and sowed Turnips, in two succeeding years, the last without manure, which was attended with good success.

Mr. Francis Blaikie, Bailiff to Earl Chesterfield at Bretby, on light Gravelly Land, has, 1. Fallow and Norfolk Turnips, drilled or broadcast, 2. Barley and seeds, 3. Seeds mown, 4. and 5. Seeds pastured with Sheep, and 6. Oats, sown broadcast on one furrow.

Mr. Robert C. Greaves of Ingleby, has, 1. Fallow, with 10 loads of Dung, and 160 bushels of Ticknall Lime per acre, laid on in the Autumn, if the land is clean, but if much cleaning is required for the Land, the Lime only is laid on in the Autumn, and the Dung previous to sowing the Turnips, part of which are drawn, and the remainder fed on the land, the proportion of them being regulated by the comparative fertility of the Turnip field; 2. Barley or Spring-Wheat and Seeds (viz. Red Clover 8lb., White Clover 4lb., Trefoil 4lb., and Rye-grass half a bushel per acre); 3. 4. or 5. Seeds, and 5. or 6. Wheat, harrowed in, broadcast.

Mr. William Smith at Foremarke-Park, 1. Fallow, with 200 bushels of Ticknall Lime, and 20 three-horse cart loads of Dung for Turnips, or 10 loads of Dung for Wheat; 2. Barley or Wheat, with Seeeds, (viz. Red

Red Clover 8lb., White Clover 2lb., Trefoil 2lb., and Rye-grass two pecks per acre); 3. Seeds, mown; 4. and 5. Seeds fed, and 6. Wheat or Oats.

Thomas Hassall, Esq. of Hartshorn, has, 1. Fallow and Turnips, 2. Barley and Seeds, 3. Seeds, mown, 4. or 5. Seeds fed, and 5. or 6. Wheat, Barley, or Oats: on the stronger parts of Mr. H.'s Farm, Turnips are not grown, but Wheat is substituted for Barley, and Grass-seeds are harrowed in, in the spring.

Mr. Edward Brown of Ingleby, has, 1. Fallow and Turnips, 2. Spring-Wheat and Seeds (viz. Red Clover, 6lb. or 7lb., White Clover 6lb. or 7lb.); 3. 4. 5. or 6. Seeds, and 6. or 7. Oats or Barley.

Mr. Robert Tomlin, late Bailiff to the Duke of Devonshire at Chatsworth, had, 1. Fallow, 2. Wheat, 3. Fallow and Turnips, in the Northumberland Drill or Scotch row-culture, 4. Barley and Seeds, 5. and 6. Seeds, and 7. Tares: Mr. T. limed his new Leys, with 300 bushels of Calver-Peak Lime per acre.

Mr. William Garman of Persal Pits in Croxall, on the lighter parts of his Farm, 1. Fallow, with nine tons of Breedon and Ticknall Lime in equal quantities, mixed, and Turnips; 2. Barley and Seeds (viz. Red Clover 6lb., White Clover 4lb., Trefoil 2lb., and Rye-grass two pecks); 3. 4. and 5. Seeds, 6. Oats, and 7. Wheat.

In my *Third* Class of cropping, wherein two or more Corn Crops succeed each other, I have to notice, that on the sandy Lands, the debris of the 2d Grit Rock at Dethick in Ashover, the management is, 1. Fallow; plough first in November, and after three or four spring ploughings, and rakings and pickings of the Twitch, in May or June, lay on 100 to 120 bushels of Lime, previously laid in heaps in the field and

and turned to slack it, and in the last week in June sow Turnips, white rounds, twice hoed, paid for by the day; in November and December the crop is usually eat off by Sheep. Swede Turnips have been tried, but proved small for want of earlier sowing, than was practicable. 2. Barley with Red Clover and Rye-grass, 3. Seeds, 4. Wheat, harrowed in on the ley, once ploughed; and 5. Oats, or sometimes Pease or Lentils.

Mr. Francis Blaikie, Bailiff to Earl Chesterfield at Bretby, pursues the following, on a strong red marly Clay, 1. Fallow, with Swedish Turnips, in rows 20 inches apart, the ground having been previously well pulverised, cleaned and manured, with 128 bushels of Ticknall Lime, or with dung; 2. Barley or Spring Wheat, with Seeds (viz. Red Clover 8 lb., White Clover 4lb., and Rye-grass two pecks per acre); 3. Seeds mown, 4. Seeds pastured, 5. Wheat dibbled, or sown broadcast, on one ploughing, and 6. Oats on two, or Barley on three ploughings, one of which is done in the Autumn, the others in the Spring; the crop drilled and hoed; Women here hand-hoe, at 5s. per acre, men are not very expert at hoeing.

Mr. John Smith of Repton, on Red Marl, 1. Fallow, limed with 120 bushels from Ticknall, for Turnips, 2. Wheat, or Barley with Seeds (viz. Red Clover, White Clover, a little Trefoil and Rye-grass); 3. Seeds, 4. Wheat, and 5. Oats.

Mr. Thomas Brain, the Bailiff of Earl Vernon at Sudbury, was getting his Farm into two courses when I saw it, viz. on part, 1. Fallow, 2. Wheat, 3. Oats, and 4. Seeds; and on part, 1. Fallow and Turnips, 2. Barley or Oats, and 3. Beans.

Mr. John Pearsal of Foremarke, 1. Fallow, with 140 bushels or two waggon loads of Ticknall Lime, and

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20 four-horse cart loads of Dung (15 to 20 tons), laid on and spread separately, before sowing Turnips; 2. Barley, with Seeds (viz. Red Clover 10lb., White Clover 4½ lb., Trefoil, 2½ lb., and Rye-grass two pecks per acre), the Barley sown broadcast and harrowed in; 3. Seeds; 4. Seeds; 5. Oats; 6. Wheat, and 7. Barley.

Mr. Robert Lea of Burrow Fields in Walton, 1. Fallow, (with Turnips on the lighter parts, dressed with 15 cart loads of Dung, and 10 bushels of Ticknall Lime, per acre); 2. Barley and Seeds; 3. 4. and 5. Seeds; 6. Beans or Oats; and 7. Wheat.

Mr. Thomas Lea of Stapenhill, 1. Fallow, with 120 to 160 bushels of Ticknall, or 80 bushels of Breedon Lime; Turnips can't be eat or drawn without poaching; 2. Barley (sow three bushels and a half, and usually reap five quarters), and Seeds (viz. Red Clover 8 lb., White Clover 4lb., Rye-grass half a bushel, and sometimes 3 or 4 lb. of Trefoil); 3. 4. and 5. Seeds, mown every year; 6. Beans drilled, three bushels and a half of Seed, and twice hand-hoed, cut with a Badging-hook or Reaping-hook, and tied up with pease-straw bands, produce three to five quarters; and 7. Wheat broadcast, two bushels and a half of Seed, produce 20 to 30 bushels. Mr. L. thinks the above quantity of the Breedon Magnesian Lime, answers better on strong red Land than Ticknall Lime.

Mr. Thomas Moore of Lullington, 1. Fallow, and Turnips on the lighter parts, or Cabbages; 2. Barley and Seeds (viz. Red Clover 10 lb., White Clover 3 lb., Trefoil 1½ lb., and Rye-grass three-fourths of a peck per acre); 3. 4. 5. or 6. Seeds; 6. or 7. Oats or Beans; and 7. or 8. Wheat manured.

Mr. Benjamin Mouslay of Hono-hill in Chilcote, 1. Fallow,

1. Fallow; 2. Barley and Seeds (viz. Red Clover 10lb., White Clover 4lb., Trefoil 2lb., and Rye-grass 2 pecks per acre); 3. to 12. Seeds; 13. Oats, or Beans; and 14. Wheat, if in condition.

Mr. James Matthews of Loscoe Farm in Repton, 1. Fallow, with 140 bushels of Ticknall Lime, and 10 good cart loads (14 or 15 tons) of rotten Dung, for Turnips, fed off; 2. Barley and Seeds (viz. Red Clover 12 lb., White Clover 3lb., and Rye-grass 2 pecks); 3. to 9. Seeds, according to the state of the Turf, which is here much infested by the white Grub and the red Wire-worm; and the Crows, in searching for these, tear up the sward; 10. Wheat harrowed in on the ley; and 11. Oats, on the best parts of the Land.

Abraham Hoskins, Esq. of Newton Solney, 1. Fallow, sometimes Lime, with 130 bushels of Ticknall or of Crich Lime, having tried them together without any material difference in the effects: never dungs Arable Land, except when in Seeds, conceiving dung, in fallowing, to be part sunk below the roots of the Corn, and great part of it lost, by exposure on the surface; sows no Common, but all Swede Turnips; 2. Barley and Seeds (viz. Red Clover 4 lb., White Clover 12 lb., Rib-grass 2 lb., if intended to lay several years, or Red Clover 8lb., White Clover 4lb., and a peck of Rye-grass, if to lay only one year), or, 2. Wheat; 3. Seeds, mowed, and the aftermath eat; 4. Seeds manured in the Spring, with twelve tons of Dung per acre; 4. 5. or 6. Seeds; 6. or 7. Wheat or Oats; and 7. or 8. Barley or Oats.

Mr. Thomas Jowett, sen. of Draycot in Sawley, 1. Fallow for Turnips; 2. Barley, and Seeds (viz. Red Clover 8 lb., White Clover 6lb., Trefoil 1lb., Rye-

Rye-grass 1 peck); 3. to 7. Seeds; 8. Oats or Beans, harrowed in; and 9. Wheat.

Mr. Isaac Bennet, jun. of Over Haddon, 1. Fallow dunged for Turnips; 2. Barley, and Seeds (viz. White Clover, Trefoil, Rib-grass, and some Red Clover); 3. to 7. Seeds, sometimes mown; 8. Oats; and 9. Oats.

Mr. William Jessop, jun. of Butterley in Pentrich, 1. Fallow, with two ploughings and harrowings, or more: between Hay and Corn Harvest, Crich Lime is laid in large heaps in the Fields and slacked, and spread in the middle of September, from 12 to 15 quarters (of eight level bushels) per acre, and ploughed in immediately, before wet falls, or it burns the horses feet; on this ploughing, sow 2. Wheat, and harrow it in: sometimes 18 to 20 loads (of 20 to 25 cwt.) of yard Dung is spread on the Lime, before ploughing: Red Clover is sown in the Spring and harrowed in, and sometimes Rye-grass with it; 3. Seeds, mown; 4. Wheat; and 5. Pease, or Tares, or Oats. Bad managers, on the Coal-measure Soils, sow Oats again at the end of the above course. Turnips are sometimes grown broadcast, after dunging and liming as above, sown in the end of July or beginning of August, and eat off with Sheep.

Mr. Henry Fletcher of Killis in Horsley, 1. Fallow, with 100 bushels (10 quarters) of Crich Lime; 2. Wheat, with Clover harrowed in, in March; in the neighbourhood, the Farmers only roll, but Mr. F. finds, that harrowing earths up the Wheat, and prevents the land baking; 3. Seeds, mown, and the aftermath fed; 4. Wheat; and 5. Oats or Pease. Mr. F. ploughs twitchy Lands but once, and uses the Scufflers and Harrows for all the further cleanings.

Mr.

Mr. Samuel Rowland of Mickleover, 1. Fallow, with either 160 bushels of Ticknall or 125 bushels of Turnditch Lime, or Dung with 12 to 15 three-horse cart loads of yard Dung; 2. Wheat, produce 32 bushels on an average; Red Clover or Cow-grass, 15 lb., is harrowed in, in March or beginning of April; 3. Clover, mown; or 3. and 4. or 5. Cow-grass, fed; 5. or 6. Wheat; and 6. or 7. Beans; five bushels of seed, produce 24 bushels.

Mr. Samuel Cocker of Ilkeston, 1. Fallow, half for Wheat, with 120 bushels of Crich Lime per acre, half for Turnips, with 120 bushels of Lime, and 12 three-horse cart loads of rotten yard Dung, or Ashes, privy Soil, &c., from the Town; half Common and half Swede Turnips, the crops all carted off, or to Grass Land for Sheep, and for Beasts in stalls, when washed; 2. Wheat or Barley with Seeds (viz. Red Clover 4 lb., White Clover 10 lb., Trefoil 4 lb., and Rye-grass 1 peck per acre, mixed before sowing, for laying two or three years, or for one year 14 lb. of Red Clover, and a peck of good Rye-grass); 3. Clover; 4. Wheat, manured with 40 bushels of Soot in March; and 5. Beans, or Pease, or Oats.

Mr. Thomas Prinsep of Croxall, 1. Fallow, with Dung or Lime; 2. Wheat; 3. Barley, with Seeds (viz. Red and White Clover, Trefoil, and Rye-grass); 4. 5. and 6. Seeds; 7. Oats; and 8. Beans.

Mr. Robert Lea of Burrow Fields in Walton, 1. Fallow; 2. Wheat; 3. Barley and Seeds (viz. Red Clover 8 lb., White Clover 4 lb., Rye-grass 2 pecks per acre); 4. 5. and 6. Seeds; and 7. Beans or Oats.

Mr. John Holland of Barton-fields, 1. Fallow; 2. Wheat; 3. Barley, or Oats and Seeds; 4. and 5. Seeds; and 6. Oats.

Mr.

Mr. Matthew Webb of Donkill Pits in Catton, 1. Fallow; 2. Wheat; 3. Barley and Seeds (viz. Red Clover 10lb., White Clover 3lb., and Rye-grass 1 peck per acre); 4. and 5. or 6. Seeds; and 6. or 7. Beans or Oats.

Mr. William Garman of Persal Pits in Croxall, on the stronger parts of his Farm, 1. Fallow; 2. Wheat; 3. Barley and Seeds (viz. Red Clover 6lb., White Clover 4lb., Trefoil 2lb., and Rye-grass 2 pecks per acre); 4. and 5. Seeds; and 6. Oats or Beans.

Mr. Benjamin Mouslay of Hono-hill in Chilcote, 1. Fallow; 2. Wheat; 3. Barley and Seeds; 4. and 5. Seeds; and 6. Beans.

Mr. John Webb of Barton Lodge, until lately, had on part of his Farm, 1. Fallow; 2. Wheat; 3. Oats or Barley and Seeds (viz. Red Clover 8lb., White Clover 4lb., Trefoil 2lb., and Rye-grass 1 peck, per acre); 4. or 5. Seeds; and 5. or 6. Oats. His present course is, 1. Fallow, without Lime; 2. Spring Wheat, winter-ploughed, and not sown before the 15th of April, with 12 lb. of Red Clover only; 3. Clover, mown, manured with yard Dung in March, 15 three-horse carts of rotten or 24 cart loads of fresh Dung; 4. Wheat or Oats; 5. Fallow; 6. Wheat; 7. Beans, after Winter ploughing and Clover; 8. Clover; and 9. Wheat or Oats.

In some instances of clean Lands, I found Fallows dispensed with, and a Bean crop substituted. Mr. Francis Blaikie, Bailiff to Earl Chesterfield at Bretby, manures the stubbles of Oats, and dibbles Beans, (1) on one ploughing in rows two feet apart, so as to admit of a single-horse Plough and Hoe between the rows: the ploughing and hoeing repeated as often as necessary, in the course of the Summer, by which means the ground is

is made as clean, and is more fertilized, and is in other respects in a better state, than after a dead fallow; 2. Wheat, on one ploughing, drilled and hoed; 3. Barley, drilled on three ploughings (with 12 lb. of Red Clover per acre); 4. Clover, 5. Wheat dibbled, or sown broadcast on one ploughing, trod in by a flock of sheep, if the land is dry at the time of sowing; and 6. Oats on two, or Barley drilled on three ploughings, one of which is done in the Autumn, and the others in the Spring: the crop carefully hand-hoed by women.

Mr. John Smith of Repton, on his Oat stubbles manured, sows, 1. Beans, 2. Barley and Seeds, 3. Seeds, 4. Wheat, and 5. Beans or Oats.

Some other courses of husbandry pursued in the County, after breaking up old Pasture Land, will be mentioned in Section 2, of Chap. VIII.; and others after the breaking up of Common Land, in Sect. 2, of Chap. XII.

The practice of Cross-cropping or Scriggling, by breaking in upon the proper course with extra Corn Crops, is too common in various parts of this as well as other counties.

Before proceeding to speak of the different kinds of *Corn Crops*, in the following Sections of this Chapter, I shall here insert some particulars respecting the Stacking and Preserving of Corn Crops, having already spoken of *Rick Stands* at page 66. In most parts of this County, a very commendable neatness is observable in the *Corn Ricks;* in many instances, after the sides of the loose Corn Ricks are pulled by hand, to a regular shape, a labourer with the point of a spade, turns and tucks in the ends of the Corn, in horizontal layers of four or five inches thick, one above the other, over the whole surface of the Rick, so that no ends of the straws

straws appear, and as this is done with considerable force, the straw is so tightly compressed in each of these layers, that Birds cannot penetrate them, as they often do in those Ricks where the open ends of the straws are exposed, and consume great quantities of the Corn. After this operation, of tucking the Ricks, is performed, Shears are used, to clip off all loose or projecting straws, and the Ricks have then the appearance of the utmost neatness and security. I noticed Ricks of Barley and Oats, thus preserved, in Chellaston, Swarkestone, Aston, Stretton-en-le-Fields, &c.

In the excellent Farming Establishment in Bradby-Park, I was somewhat surprised to see the Oat and Barley Ricks standing on the Ground; but Mr. Francis Blaikie, Earl Chesterfield's Bailiff, informed me, that having no Ponds of Water near the Rick-Yard, they found no serious injury from Rats or Mice, in the loose Corn Stacks, so placed. A frame of Wood is laid on the ground, of the exact size of each Rick, and the middle is laid with faggots, to keep the Corn from the ground; and after the Ricks are built, their outsides are clipped or cut smooth down to the edges of the frames of wood, as cannot be done to the irregular ends of Faggots or Billets of Wood, as they are usually laid under Ricks, when set on the ground.

## SECT. IV.—WHEAT.

DERBYSHIRE is by no means a famous county for Wheat; for altho' the lands on the Red Marl Strata in the Southern part of the County, and the lower parts of the Hundred of Scarsdale on the Eastern side of the

the County, produce great quantities of most excellent Wheat, yet the higher parts of the Peak Hundreds are little adapted to its culture, and there a field of Wheat is rarely to be met with, Oats being found to answer much better in these elevated situations. I noticed Wheat growing in Bakewell, Blackwell, Chisworth, Gamesley, Hope, Lulworth, Mellor, Over Haddon, Stanton in the Peak, &c.—In treating of the Courses of Crops, in the last Section, many things have been mentioned, which relate to the preparation and manuring for Wheat, in which last view, the application of Lime stands prominent.

Mr. William Cox of Culland informed me, that he wishes always a rough clot at the time of sowing Wheat, in preference to land that is fine, because the latter is apt to set or run together; and that the clots, by mouldering in the winter with the frosts, earth up the plants. Deep ploughing in the Coal-measure soils, on the borders of Nottinghamshire, is found prejudicial to Wheat.

Mr. Thomas Kirk of Bramley, finds that Manure along with Lime, on the newly-inclosed Bramley Moor in Eckington, don't answer so well, for Wheat, as Lime alone; he supposed, because Manure lightens and Lime consolidates this sandy soil, the Debris of the 9th Grit Rock. At Stanton in the Peak, on the Limestone Shale, Wheat succeeds better on a Fallow, than on Clover-leys, which are apt to throw out the plants after frosts.

Mr. Philip Oakden of Bentley Hall, sometimes harrows in Wheat, on Clover Edish previously ploughed in, at the end of August.

*Seed.*—The advantage of having Seed from early Districts,

Districts, is understood by many Farmers in the Northern part of Derbyshire, and who annually procure their Seed Wheat from Dunstable in Bedfordshire, and from other Southern Districts, as in Stanton in the Peak, Ridgeway, &c. and find, that the same ripens considerably earlier than Crops from Seed grown in the neighbourhood; a property which is not possessed by the produce of this foreign Seed. At Foremarke-Park, Mr. William Smith sows about the middle of October, three bushels of Seed Wheat per acre; the produce about 32 bushels (of 35 quarts). At Waldley Mr. Thomas Bowyer usually sows about one bushel and a half of Wheat; his average produce about 25 bushels.

Mr. John Webb of Barton Lodge, on a clean and good naked Fallow, on Red Marl, without Manure, sowed in the Autumn of 1808, 30 quarts of Seed per acre on half of the Field, and 60 quarts per acre of the same Seed on the remainder of the Field, and found at Harvest, that there was no perceptible difference in the Crops, the whole, perhaps, yielding 30 bushels per acre. Mr. Samuel Cocker of Ilkeston, sows from seven to nine pecks of Wheat per acre; his produce 16 to 32 bushels per acre.

At Ridgeway in Eckington, the quantity sown is eight to twelve pecks, the average produce 30 bushels. Mr. Joseph Butler of Norbrigs, a few years ago, sowed one bushel of Seed, and had a produce of 30 bushels of Wheat. Lord Vernon's produce, at Sudbury, 30 bushels. Bache Thornhill, Esq. at Stanton in the Peak, 9 to 52½ bushels, average produce about 30 bushels per acre.

*Steeping.*—The practice of steeping or pickling Seed Wheat, is almost general in this County.—Mr. William

Greaves of Bakewell, steeps his Seed Wheat in stale Urine, and dries it in quick Lime, previous to sowing. Mr. Joseph Butler of Killamarsh, dissolves two pounds of blue Copperas, in as much Chamber Lye as will wet twelve bushels of Wheat, and, after soaking, dries the Wheat in quick Lime. Newly-dunged lands are, according to Mr. Butler, much more subject to smutty crops than limed lands; especially if the dung was not thrown up and fermented, but carted from the yard.

Mr. George Clay of Arleston, brines his Seed Wheat, each morning of sowing: the Wheat is sifted into a Brine of Salt, that will bear an Egg, half a bushel of the day's sowing being added at a time, stirring and skimming between each; after the Wheat has been an hour in the Brine, the same is drawn off, and as much quick Lime stirred into the Wheat, as will make it part for sowing: pursuing this plan, Mr. Clay has never had smutty Wheat, but twice, in 40 years, and then only from small quantities of Seed that were sown without steeping, in order to make up the Seed wanted. The like thing has more than once happened to Mr. Thomas Jowett, senior, of Draycot in Sawley, on omitting to brine a small part of his Seed Wheat.

Mr. Samuel Rowland of Mickleover, instead of Salt Brine, which is expensive, uses Soapers' Waste, obtained from the Soap-boilers in Derby, in Casks, at a cheap rate, which he dilutes with Water, till it will just bear an Egg, and after soaking his Seed Wheat therein, dries it with quick Lime.

Mr. Francis Blaikie, Bailiff to the Earl of Chesterfield, in a very able paper on this subject, printed in Sir John Sinclair's "Enquiries respecting the Cause of the Rust and the Mildew in Wheat," and in the "Farmer's Magazine," Vol. IX. p. 403, states the use of

Brine

Brine of Salt, strong enough to bear an Egg, for soaking Seed Wheat during two hours, after the same has been previously washed, in clear water, three times changed, and then drying the Seed with quick Lime, to be certainly efficacious in preventing Smut, even if the Seed Corn were previously Smutty; and by the most satisfactory experiments, this Gentleman shows, that clean Seed Wheat will be thoroughly infected, and produce a Smutty Crop, by being put up in Sacks that have held Smutty Wheat, or laid on a Barn-Floor on which Smutty Wheat has been thrashed! such is the contagious nature of this pestilential disease of Wheat. To all such as still doubt the infectious nature of Smut, and the utility of pickling Seed for preventing its propagation, I wish to recommend the perusal of Mr. Blaikie's Paper, and a careful repetition of his interesting experiments on this subject, the results of which, are so exactly consonant with the long experience of Messrs. Clay and Jowett, above-mentioned.

When I was at Waldley, I was shown a Field, on Red Marl, which lays rather low in the Valley, in the occupation of Mr. Thomas Archer, which has been excessively tilled and cropped, for many years past, and has been so infested by Smut, that one-fifth of the Ears of Wheat have sometimes been smutted, and which is, by his Neighbours, attributed to its excessive cropping. At Woodhouse Farm in Doveridge, Mr. John Massey Frost had a Field of thirteen acres on Red Marl, on the hill, very much mildewed.

Mr. Edward Brown of Ingleby related to me the following Experiment, made in 1807 and 1808, on very light sandy Gravel, on his Cucko-Park Farm. On the 5th of October, he sowed a first parcel of Autumn Wheat, which had been steeped in old Netting or

 Chamber-

Chamber-lye and dried in quick Lime: on the 6th sowed a second parcel of the same Wheat dry, without any preparation; and a third parcel, washed repeatedly in clear spring Water, and dried with Lime: on the 16th sowed a fourth parcel of the same Wheat, which had been steeped a quarter of an hour in a solution (or mixture rather, since a complete solution did not take place) of one pound of Arsenic in thirty gallons of spring Water, frequently stirred, and dried with Lime: and on the 19th sowed a fifth parcel of the same Seed, steeped a quarter of an hour in Salt Brine, strong enough to bear an Egg, and dried with Lime. The whole was sown broadcast in the same field, and reaped on the same day: the second parcel, sown dry, and the fourth prepared with Arsenic, proved very nearly free of Smut, and was not objected to by the Miller when sold: the first or netted parcel, the third washed, and the fifth salted, all proved badly smutted: out of twelve quarters, nearly two quarters of Smut-balls were collected. From the above, Mr. Brown has been induced to consider Autumn Wheat, as subject to Smut on his soil, and to cultivate only Spring Wheat ever since; and which very nearly escapes Smut.

*Sorts of Wheat.*—The red and white varieties of Autumn Wheat (*triticum hybernum**) are those most cultivated in this County. In the open fields of Hollington I saw four-row'd bearded Wheat, growing, and which promised well. Mr. Thomas Bowyer of Waldley in Cubley, has for some years past cultivated bearded blue Cone Wheat, which grows five feet high,

* See a good description and history of this and other kinds of Grain, in the Agricultural Magazine, for September and October 1811, Vol. IX, and

and is not subject to be laid, or to mildew, which disease was making the most deplorable ravages on the other Wheat Crops, at the time that I visited his Farm, in August 1809; the produce usually near 40 bushels per acre, and makes excellent household Flour: some few ears of this grain are not bearded, but their produce next year generally proves so. Mr. Samuel Emery of Upwoods in Doveridge, had in 1809, a field of four acres of this bearded blue Cone Wheat, ½ *m.* S of Marston Montgomery, which was standing perfectly, and tho' the Mildew had seized the bottom of the straw, it had less affected it, than the common Wheats in the vicinity: the produce was estimated at 36 to 40 bushels per acre. The Rev. Francis Bradshaw of Holbrook tried a variety, called Jerusalem Wheat, on the clayey part of his Farm, but it did not answer.

*Spring Wheat* (*triticum æstivum*) is now pretty extensively cultivated, by the following persons, viz.

The Rev. Francis Bradshaw of Holbrook, where it was found much subject to Mildew.

Mr. Edward Brown of Ingleby, in 1806 had his Spring Wheat Seed from Gibbs and Co. which proved a very poor and thin crop, on his very sandy gravelly soil: this produce he sowed again in 1807, and had from three acres all but two perches, 12 quarters 6¾ bushels (of 34 quarts), weighing 67½ lb. per bushel: from the same produce used in 1808, he reaped 30¾ bushels per acre, weighing 65 lb. per bushel: in 1809 the same produce was still used for Seed, and the estimation of its produce was 32 bushels per acre, and 67 lb. or 68 lb. per bushel, the sample being much better than ever before.

Mr. William Cox of Culland, in 1808, had 13 acres of Spring Wheat, the produce 32 bushels per acre; in

 1809,

1809, he had seven acres: he prefers this grain to Barley for raising a crop of Seeds, as it don't smother the Crop so much.

Mr. Richard Harrison of Ash, in Sutton-on-the-Hill, grows Spring Wheat in lieu of Barley with his Seeds, and finds it answer better: he has sometimes had 40 bushels per acre, on Red Marl, of 67 lb. per bushel (of 35 quarts, or Derby measure), and in general it escapes the Mildew better than Autumn Wheat: in the last week in September 1809, I saw a tall crop of Clover among Spring Wheat on this Farm, the straw of which was perfectly white, when Mildew almost universally prevailed.

Mr. Thomas Harvey of Hoon Hay, cultivates Spring Wheat instead of Barley: in 1804 his produce was 24 bushels per acre, of a good sample; in 1805, 2½ bushels were sown per acre broadcast and harrowed in, in the first week in April, after Turnips, the produce only 15 bushels per acre.

Mr. Thomas Jowett of Draycot in Sawley, has had very good crops of Spring Wheat; it is apt to Smut in the neighbourhood, but don't Mildew.

Mr. Christopher Kirk of Aston, had in 1809, half an acre of Spring Wheat, which in April seem'd more promising than the remainder of the field of Autumn Wheat.

Mr. Robert Lea of Burrow Fields, has cultivated Spring Wheat, but finding it more mildewed than the Autumn Wheat has discontinued its culture.

William Drury Lowe, Esq. of Locko-Park in Spondon, cultivates Spring Wheat, and finds it more free from Mildew than Autumn Wheat: had seven acres in 1809.

Mr. Thomas Moore of Lullington, has grown Spring Wheat

Wheat instead of Barley, but has discontinued it, finding his Seeds not so good as with Barley.

Mr. William Needham of Great Hucklow, showed me a field of Spring Wheat, S of Windmill Houses, after Turnips on Turf Ashes, without Lime or Dung: it was limed for the Spring Wheat, which looked very well: other pieces of Spring Wheat in the neighbourhood without Lime, were looking very ill.

Edward S. Sitwell, Esq. of Stanesby in Horsley, had in 1809, a piece of Spring Wheat, after Turnips.

Mr. John Webb of Barton Lodge, did not sow his Spring Wheat in 1809 before the 15th of April, with 12 lb. of Red Clover only; it was quite free from Mildew: in 1808, after a Fallow, the produce was 33 bushels per acre, weighing 66 lb. per bushel (of 36 quarts): a crop of Oats had preceded the Fallow, and part was then limed with 80 bushels of Birchwood-Park Lime, the other no Manure, and no difference was observable in the Oat crop: with the Spring Wheat, Seeds were sown, viz. Red Clover 4 lb. White Clover 6 lb. Trefoil 2 lb. Rib-grass 3 lb. and Hay-seeds from the Peak Limestone Land, 8 bushels; the Seeds the best ever seen on the Farm, intended for permanent Pasture; the Cattle on the aftermath seemed to prefer the limed part. Mr. Webb had his Spring Wheat originally, from Mr. Nathaniel Stubbins of Holmpierpoint, Notts; the produce is about equal to that of Oats, and the Seeds succeed much better with the former than the latter.

A mixture of Corn, called Blend Corn, sometimes arises from sowing Wheat upon Barley or Oat stubbles, as is now a good deal practised about Alton in Ashover, after paring and raking and burning, or carrying off the stubble; and sometimes when the Wheat plants are thrown

thrown out of the ground by the frosts in the winter, Barley is sown to thicken and make up the crop.

*Reaping.*—At Bretby, and at Foremarke, the price given for reaping Wheat is 15*s.* per acre, with Small Beer and Ale, or 6*d.* per Thrave of 24 Sheaves; a full crop only 5*d.* per Thrave: each Sheaf should be a yard in circumference, but they seldom exceed three quarters of a yard. At Foremarke-Park 6*d.* to 7*d.* per Thrave, with one gallon of Small Beer and one pint of Ale per Man per day. About Buxton the Reaping of Wheat is principally performed by the Women, at 6*d.* per Thrave. At Barton Lodge Mr. John Webb gives 5*d.* per Thrave, and maintains, that the Sheaves should not want more than two or three inches of being a yard round.

Reaping-hooks are much used, ground smooth and sharp on the edge, but these having been found to cut the Straws while entering, before the Reaper has gathered them in his hand, and such Straws consequently fall loose on the ground, Mr. Joseph Hutton, jun. of Ridgeway, invented in 1807 an improved Reaping-hook, for which he was rewarded with a Medal from the Society of Arts in the Adelphi, London, who have preserved a Model, and published a Description of the same in their 28th Volume of Transactions, p. 54. These Hooks are back'd thro' almost half their length from the point, like a Sickle, and the remainder is ground sharp. From the certificates that are printed, it appears, that great saving of Corn is effected by the use of these Reaping-hooks, and that they have obtained a considerable sale.

It is not uncommon, for ten Sheaves of Corn to be set up together, five in length, and two other Sheaves

to

to have their ears parted and turned over these, so as to hood them, (making together a Thrave), particularly in catching seasons.

The lateness of the Harvest in the Peak Hundreds, has been spoken of at page 96 of vol. I.

On the *Distempers* of Wheat, I have spoken above, under Steeping. About Bakewell, it was formerly a practice, for two men walking in the furrows, to lash the dew off the lands of Wheat, as a preventative of Mildew. That warm and moist weather at and before the ripening of Wheat, occasions the Mildew, no one can doubt, and a perfect remedy seems hopeless, I fear.

The *Wire-worm* commits its depredations on Wheat, in April, on the light and high lands of Bramley Moor in Eckington. In Waldley, the Wheats on the old lays were affected in the Spring of 1809, with the Wire-worm. At Foremarke-Park, its effects have also been of late years experienced. At Loscoe Farm in Repton, the Red Wire-worm has been troublesome. In May last (1811), the Wire-worm was observed at work at several places, in the south of Derbyshire, by the Gentleman who communicated the Report for the Farmer's Journal, inserted in that paper of the 13th of May: the benefit of Lime in stiffening the soil, and of trampling it by horses, is there mentioned, for preventing the ravages of the Wire-worm upon the Wheats. A new kind of Wire-worm is drawn and described in Nicholson's Journal, 8vo. vol. XXIII. p. 102.

It is a white thin grub with a yellow head, that so infests the mossy pastures at Ingleby, Loscoe Farm, &c., as mentioned page 108.

*Thrashing*.—The flail is still extensively used, tho' Thrashing-mills are fast coming into use, as observed, p. 49;

p. 49; two of these are used to thrash *for hire*, in and near Measham. Mr. Thomas Elton (in Partnership with Mr. John Johnson and Mr. Joseph Pratt) in April 1809, erected a four-horse Noon's Machine, in Oakthorp, with the intention of thrashing for the Neighbourhood, at the rate of 6*d*. per strike or bushel of winnowed Corn; the Farmers bringing their Corn, and taking back their straw and cavings, along with their grain: the whole Village have brought their Wheat to be thus thrashed, and the plan seems to give great satisfaction. Mr. John Johnson occasionally employs his machine at Union Farm, in thrashing on the above terms, for Farmers who have brought their Wheat as much as 2½ miles, to be thrashed. This plan is calculated to well repay the expence of erecting good and substantial Machines, of sufficient power, (and none others are found to thrash clean and answer) and with Salmon's portable Machine, of two, three, or four-horse power (made by Wm. Shepherd of Woburn, Beds.), that can be moved from one Barn to another, seem to render it probable, that at some future period, the *Thrasher* may be as established, and as profitable a business, as the Miller has long been.

*Stubbles*.—Mr. John Blackwall of Blackwall, uses a Paring Plough on his Wheat and other stubbles, immediately after Harvest, and then harrows and rakes out all the straw, roots, and weeds, carts them home, and spreads them in the bottom of his fold-yard, to be trodden into muck: by which harrowing and raking, the shed Corn and seeds of Weeds, immediately vegetate, and prove of some use to the Sheep late in the Autumn; which, and the severity of the following Winter, effects the destruction of most of what might otherwise

otherwise prove detrimental, by vegetating next Spring: this practice appears to me very worthy of more general adoption.

Mr. John Webb of Barton Lodge, always breaks up his Stubbles at the end of November, or in December.

## SECT. V.—RYE, (*secale cereale*).

I MET with no instance of Rye being grown for a Crop in the County: Mr. William Smith of Foremarke-Park, grows it with Dills or winter Tares, for soiling his Horses.

## SECT. VI.—BARLEY.

MANY particulars of the cultivation of the common sort of this grain (*hordeum vulgare*) have already been given, in treating of Courses of Crops, pages 102 to 112. In Alfreton, Barlow, Beighton, Bolsover, Brailsford, Church Gresley, Meadow, &c. this grain is also cultivated: at Beighton it is reaped and tied up in Sheaves, as Wheat is. In Callenge-low Farm in Yolgrave, Mr. John Blore had, in 1809, a fine crop of Barley after Turnips, the land having been pared and burnt in the preceding year. In Over Haddon, Mr. Isaac Bennet produces fine crops, that ripen early enough, notwithstanding all that has been said to the disadvantage of the High Peak climate.

The *Time* of sowing Barley, is said by some to be, when

when Oaks become gosling grey, and by others, on the budding and leafing of the Birch Tree.

Barley is not found to answer at Stanton in the Peak, where the Game is preserved, being so much more subject to be eat up by Hares, than Oats are.

The *Sorts* of Barley. At Wingerworth, Sir Thomas Windsor Hunloke, Bart. cultivates Winter Barley, a large white variety.

At Holbrook, the Rev Francis Bradshaw cultivates Corsican, skinless or naked Barley, the seed lately imported, cost 21*s*. per bushel: the produce on a Gritstone soil 18 to 1, besides the light grain: it was found to make less measure of Malt, than common Barley, but of good quality. Mr. Richard Fowler strongly recommends the culture of the northern naked Barley, in the Letters and Papers of the Bath Society, vol. XII. p. 169. In his Garden at Overton, Sir Joseph Banks, Bart., cultivates a black variety of winter Barley, six-rowed, with very strong awns, which produces much herbage in the Spring; the grain of which variety is much sought after by the Maltsters and Brewers, as I am informed.

*Seed* and *Produce*.—At Foremarke-Park, Mr. William Smith usually sows three bushels per acre, in April, and obtains about four quarters (of 35 quarts to the bushel). At Waldley in Cubley, Mr. Thomas Bowyer sows three bushels of Barley, the produce usually 32 bushels. An odd corn of Barley, in a field of Spring Wheat at Barton Lodge, in 1808, produced eight ears with two rows of 16 each, or 256 corns in the whole. At Ilkeston Hall Farm, Mr. Samuel Cocker usually sows four bushels of Barley, and has a

produce

produce of 32 bushels. Lord Vernon's produce at Sudbury, 40 bushels.

*Malt.*—I noticed Malt Offices at the following places, viz. Alfreton, St. Alkmund Derby, Alport, Appleby, Baslow, Belper, Belper-Gutter, Brassington, Brimmington, Bull Bridge, Burrowash, Chesterfield, Claycross, Crich, Duffield, Ford, Higham, Matlock, Repton, Shardlow, Shirland, Stoney-Middleton, Stretton, Stubbing, Whitwell, Wirksworth, Woodthorp, &c.

*Breweries*—Are established at Baslow, Burton on Trent, Cavendish Bridge near Shardlow, Chapel-en-le-Frith, Chesterfield (Mr. John Shepherd's) and at Derby, for public sale. In some Farm Houses where I saw the process of Brewing, the sweet-wort was let out of the mash-tub on to the Hops, instead of their being put into the Wort, when subsequently boiling in the Copper. Hard water is said to be preferred by the Brewers of the famous Burton Ale. The Cellars of Chatsworth and Hardwick, belonging to His Grace of Devonshire, are celebrated for the very strong Ale they contain. At Staveley, the Rev. Francis Gisborne was said to have Ale by him, of 60 or 70 years old: and at Eyam, Major William Carliel some of 40 years old, or more.

Barley is very little used for Bread, in or near Derbyshire.

## SECT. VII.—OATS.

The cultivation of the common Oat (*avena sativa*) has been spoken of, along with the Courses of Crops.

*Sorts*—Of Oats. Black Oats are a good deal cultivated, by Mr. Joseph Gould of Pilsbury, and many others. The American, or Potatoe Oat, was regularly cultivated by the late Dr. Bruckfield at Alton, the produce 70 to 84 bushels per acre, weighing 49lb. each.

Mr. Thomas Bowyer of Waldley, cultivates this variety of Oat, having a remarkable redness on the straw, previous to the ripening of the Corn; and on fresh and cool land, he finds them yield 50 strikes per acre, weighing 52 lb. per strike (of 36 quarts), and capable of making 32 lb. of Oatmeal per strike: on old tilled lands the produce of this Oat is very inferior.

About Brailsford I found the Potatoe Oat laid aside, after being extensively used, on account of the deficiency of produce, altho'. the meal they yielded per strike was very great. On poor land this variety of Oat has been found to degenerate very fast, and the straw to be strong and unfit for Cattle. A variety of Oats very like the Potatoe Oats, called Short-Whites or Holland Oats, has long been in use at Blackwall, and in other parts of the County, and its Straw is less coarse than the former. Poland Oats are cultivated by Mr. John Blackwall of Blackwall. About Alfreton, a variety called the Tartarian Oat, is cultivated by some Farmers.

On the hills in Ashover, and most other parts of the County, the Oats are reaped and tied up in Sheaves, and

and the shocks or Thraves hooded, by opening and reversing some of the sheaves, to act as thatch to the others.

*Seed* and *Produce.*—At Foremarke-Park Mr. William Smith sows, about the middle of March, six bushels of Oats, and his average produce is about 40 bushels (of 35 quarts) per acre. At Pilsbury the average produce of Oats is about 56 bushels.

At Waldley Mr. Thomas Bowyer sows five bushels of Oats, and he stated his usual produce at 25 to 30 bushels. At Sutton-on-the-Hill, after Wheat in a three-years' course, the produce often only 12 or 14 bushels. At Blackwall Mr. John Blackwall sows five bushels and a half of Poland Oats, and his average crop is about 40 bushels: of Short-Whites he sows only four bushels. At Ilkeston Mr. Samuel Cocker sows four bushels, and his usual crop is 36 bushels of Oats per acre. Lord Vernon's produce at Sudbury, 30 bushels. On the light newly cultivated lands on Bramley Moor in Eckington, Oats, sown about the 8th of May, were taken off by the Wire-worm. At Hanson-Grange, Oat Harvest begins about the 1st of September, on the average.

*Oatmeal.*—Oat Bread or Haver-Cake, being the food of a considerable part of the poorer inhabitants of this County, the quantity of Oatmeal which is made here, is very considerable: the persons who deal in Oatmeal are called Swalers or Meal-men.

For making of Oatmeal, the Oats are first kiln-dried and stript of their outer husk at Mills, which are called Shilling or Shelling Mills, and are then ground into meal, of which it has been stated, that 8lb. will be

about the average produce of 14lb. of Oats, and that 1300lb. of Oatmeal is perhaps the average produce per acre.

*Oat Bread.*—Instead of using Yeast or Barm in the making of Haver-Cake, as is very general in some parts of Yorkshire, an *acid* fermentation is excited in the Leven or Batter, of which the Derbyshire Cakes are made, by a sour wooden Tub called a Doshen, in which it is mixed: and during the winter months, the House-wives are very careful, not to wash out the Doshen or tub, in which the Batter is mixed and fermented, but to leave a little of the Batter each time adhering to its sides, to commence the fermentation of the next batch: in summer time the Doshen is slightly washed out with cold water after each baking, the tub itself being then sufficiently sour to raise the next leven. At Mr. Joseph Gould's at Pilsbury, I saw the process of baking for his farm-servants, and made the following notes. The Batter, something thicker than that which is used for Pancakes, is poured on to the bakestone, (here a cast-iron plate, with a fire under it, like a common ironing stove) from a wooden Dish, and is spread by the back of a wooden ladle to about one-fourth of an inch thick, and 16 or 18 inches diameter: a cake-slice or long thin iron spatula is shortly after used, to run under the Cake, to release it from the stone, and if the back part of the stone is less or more hot than the front, it is turned round by the slice: after it has been about $1\frac{1}{2}$ to $1\frac{3}{4}$ minutes on the stone, the edges are raised by the slice, and the point of a thin wooden bake-spittle, or cake-board, is dexterously shoved under the Cake, and it is turned over and thrown again on the stone, and if necessary, is smoothed by the

slice:

slice: about $2\frac{1}{2}$ to $2\frac{3}{4}$ minutes after, it is turned again, and after $2\frac{1}{2}$ or $2\frac{3}{4}$ minutes more, having been released and turned round if necessary as in the interval before, it is taken off by the spittle, and laid hollow, across an earthen pan, considerably smaller than the Cake, to steam, for a few minutes; and when another Cake is ready, it is removed to a pile upon a board, in close contact with each other, which pile of Cakes is removed to a dry cool place, not too airy, for use during the three to seven following days, according as they bake once or twice in the week. The flat bake-stones, mentioned vol. I. p. 431, are used in many parts of the County, instead of an iron plate, and are thought to make lighter and better cake, and which will keep longer; but all the operations of baking are nearly twice as long as above, in performing, and the consumption of fuel consequently much greater. A greasy linen rag, is rubbed over the stone or plate between every three or more cakes, to prevent their burning, but sometimes this need not be repeated oftener than every tenth Cake. At Mr. Ellis Needham's Cotton-mill Apprentice-house in Litton, soured Oat-cakes, made as above, are used one day old in summer, and two days old in winter.

*Stubbles.*—The commendable practice of Mr. John Blackwall of Blackwall, with regard to his Oat Stubbles, has been mentioned already, p. 124; a practice has grown up of late in Alton, North-edge, Prass, and some other parts near Ashover, less entitled to commendation, I think, that of thinly breast-paring their Oat Stubbles, raking them into heaps and burning them, as the preparation for Stubble Turnips, on some

few of their earliest Crops, but more commonly, with the view of sowing Wheat, to succeed, perhaps their second crop of Oats in some instances.

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## SECT. VIII.—PEASE (*pisum arvensis*).

THIS Grain is not cultivated extensively in Derbyshire. At Norbrigs Mr. Joseph Butler was sowing Pease, on a Wheat Stubble, limed with 40 bushels of Bolsover blue Lime.

Mr. Henry Fletcher of Killis Farm in Horsley, cultivates Pease, and had 23 bushels per acre in 1808: Mr. Samuel Cocker of Ilkeston Hall, sows three bushels, and reaps 16 to 24 bushels: Mr. Thomas Bowyer of Waldley in Cubley, sows Pease and Beans mixt, called blending, 4 bushels, and this crop averages 30 bushels per acre: at Lord Vernon's at Sudbury, and in Hollington common-field, I saw blending.

The *boiling* property of Pease, even of the best sorts, are found here to depend greatly on the nature of the soil: the blue boiling Pea, if cultivated on very stiff land, or on very sandy land that has been limed or marled, lose their boiling property.

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## SECT. IX.—BEANS (*vicia faba*).

SEVERAL particulars of the introduction of this Grain have been mentioned, when treating of the Courses of Crops, in Sect. 3. Beans are said not to ripen on the very hilly parts of this County. At Bradby Park, they are cultivated on manured Oat

Stubbles.

Stubbles. I noticed drilled Beans at Chatsworth Park, in Lullington, and at Stapenhill, where Mr. Thomas Lea dibbled 2½ bushels of seed, and reaped 24 to 40 bushels per acre.

Mr. Philip Oakden of Bentley Hall, drills them on Clover edish ploughed in, in the preceding Autumn, and sometimes on his Fallows.

Dibbled beans were seen very common about Longford: at Alton in Wirksworth, the late Francis Bruckfield dibbled two bushels and a half of Seed: at Bretby, Chaddesden, and Persal Pits, I also saw dibbled Beans.

Mr. John Blackwall of Blackwall, uses a sharp piece of a Scythe fixed to a Stick, about the end of August, for striking off the tops of his Beans, by which he finds, that they ripen a fortnight sooner, and more regularly.

Mr. Thomas Bower of Waldley sows five bushels, and usually reaps about 30 bushels of Beans per acre, but had found them a very uncertain crop, in 1806-7-8, averaging only 12 bushels in three years.

Mr. Samuel Cocker of Ilkeston Hall, seed four bushels and a half, produce 24 bushels. Mr. Samuel Rowland of Mickleover, seed five bushels, produce 24 bushels. Mr. John Webb of Barton Lodge, on Oat Stubble, obtains 36 bushels of small Beans per acre.

Those who would wish to see an account of the Hemp, that may be prepared from Bean-stalks, may consult the Transactions of the Society of Arts, Vol. 28, p. 57.

## SECT. X.—TARES (*vicia sativa*).

WINTER Tares, Vetches, or Dills. Mr. George Clay of Arleston, and Mr. William Smith of Swarkestone Lows, sow Winter Tares on their Stubbles, preceding a Fallow, about two bushels of seed per acre, in the end of September, for soiling their Horses. At Alton in Wirksworth, the late Mr. Francis Bruckfield grew Dills for soiling Horses: at Bakewell Mr. William Greaves for ditto: at Brailsford Edward S. Cox for soiling Horses: at Chatsworth the Duke of Devonshire for soiling Horses and Oxen: at Foremarke Park, Mr. William Smith for soiling Horses: at Hoop Hay Mr. Thomas Harvey for ditto: at Bentley Hall Mr. Philip Oakden for ditto: at Lullington Mr. Thomas Moore for ditto, &c. Mr. Samuel Rowland of Mickleover, has found labour too expensive in Summer, to give Tares to his Cows in Stalls.

## SECT. XI.—LENTILS.

SPRING Tares I saw cultivated at Barton Blount by Francis Bradshaw, Esq. for soiling his grazing Cattle, in hot weather: at Blackwall by Mr. John Blackwall for a crop of Hay, between two Wheat Crops: at Blackwell by Mr. Joshua Lingard, for soiling, who sows a few Oats along with them, to hold up the Tares; and as might be expected, he finds much better Crops of Oats after Tares, than where Oats are repeatedly sown: at Lullington by Mr. Thomas Moore, for soiling. At Newhaven Mr. Timothy Greenwood sowed them

them on pared and burnt Turnip Land, after dressing with 24 or 25 tons of rotten Stable Dung per acre.

## SECT. XII.—BUCKWHEAT (*polygonum fagopyrum*).

At the Earl of Chesterfield's at Bradby Park, considerable quantities of Buckwheat or Brank, are cultivated, among the new Plantations, and the Seed used for fattening of Cows, Pigs, and Poultry. Earl Moira at Donnington Park, Sir Windsor Hunloke of Wingerworth, and some other Gentlemen, cultivate small patches of Brank in or near to their Woods, for the Pheasants and other Game, besides which I heard of no other instances, of its cultivation or use in this County.

## SECT. XIII.—TURNIPS, COMMON (*brassica rapa*).

*See Swedes, Sect. 14.*

Several particulars of the cultivation of this highly valuable Root, have already been mentioned in Sect. 3, of this Chapter, on Courses of Crops; others respecting the drilling of their Seed in Sect. 4, of Chap. V.; some on the use of Sowing-troughs, in Sect. 19, of the same Chapter; and others will be met with in Sect. 3, of Chap. XII. on Liming.

About Melborne I heard, that the cultivation of Turnips on the Stubbles of early Oat, &c. crops, was coming into fashion, as in Ashover, as is mentioned page 131.

 On

On the late Inclosure of Brassington Common, on the 4th Lime, thin Paring and Burning was generally practised, and 160 to 200 bushels of Lime spread per acre, on the Ashes, as a preparation for Turnips, after one thin ploughing only, sown in the last fortnight in June.

On the Coal-measures on the slope of Bolsover Hill, it seemed to be the opinion of the Rev. Edward Otter, that Bone-dust was essential to the obtaining a good crop of Turnips.

*Sorts.*—At Bradby Park, the Earl of Chesterfield cultivates the White-topt, Green-topt, and Globe Turnips; and lately, the Scotch yellow Turnip, with a small round top, the bulb well buried in the ground; is sweet and juicy, and is much approved of by Mr. Francis Blaikie, his Lordship's Bailiff, and as they are also in Scotland and in Norfolk, as I am informed.

Mr. Timothy Greenwood of Newhaven, sows the Norfolk Whites and the Green-tops.

A sort of round white Turnip, called Stone-top, producing few leaves, is cultivated at Rowthorn and other places near Mansfield. The round Green-topt, and the Red-topt Turnip, are cultivated at Bakewell by Mr. William Greaves: Mr. Samuel Rowland of Mickleover cultivates the Norfolk Turnip. Mr. William Smith of Foremarke-Park, sows 2 lb. of Seed per acre in the middle of June.

*Fly Preventatives*, or expedients for lessening the depredations of the *Chrysomela saltatoria*, or Turnip Beetle, as it is called, in an excellent Letter on the subject, in the Farmer's Journal Newspaper of the 27th of April 1812. My Notes on the subject are, that

that Bache Thornhill, Esq. of Stanton, sows a quarter of a pound of Radish Seed with every pound of Turnip Seed, to employ the Fly while the Turnips are young, which Mr. Joseph Gilbert his Bailiff had found to be very effectual. At Bakewell Mr. William Greaves, has seldom known his Turnips affected by the Fly.

At Blackwell Mr. Joshua Lingard, has for 14 or 15 years past well mixed three ounces of black Brimstone (a powder purchased at the Druggists') with every pound of his Turnip Seed, and left it covered up in a pot for three or four days at least, before sowing, which has almost entirely prevented the Fly or Slug from injuring his Turnips, as it has also those of many of his neighbours, who have adopted the same.

Drawing green Elder branches over the young Turnips, was formerly practised in this County, according to Mr. James Pilkington's "View of Derbyshire," Vol. I. p. 373.

*Hoeing*.—Mr. Joshua Lingard of Blackwell, pays 9*s*. per acre for twice hoeing. The late Mr. John Wall of Weston Underwood, paid for once hoeing 7*s*., and one quart of Ale and two quarts of Small Beer per acre; sometimes he hand-weeded after this. Mr. William Smith of Foremarke-Park, pays the first time of hoeing 8*s*. per acre, with three pints of Ale and two gallons of Small Beer per day, to the Hoers. Eight shillings the first and 6*s*. the second time per acre, have been mentioned as the average prices of hoeing, in the southern parts of Derbyshire.

*Consumption*.—In this County, as in most others, the far greater part of the Turnips are fed on the land by Sheep and Lambs. Mr. Joseph Gould of Pilsbury, draws

draws all but the very smallest of his Turnips, for his young Stock in the Yard. Mr. Joshua Lingard of Blackwell, draws great part of his Turnips, for his milking Cows and for those at the Straw-yard. Francis N. C. Mundy, Esq. of Markeaton, draws and cuts all his Turnips for his Sheep. Mr. Robert C. Greaves of Ingleby, draws part of his Turnips from the richer parts of his Land, according to the wants of his Stock in the Yard. Mr. Timothy Greenwood of Newhaven, usually draws one-fifth part of his Crop, from each land, and gives them (without washing or slicing) to the Beasts in his Yard, and feeds off the remainder with Sheep, as usual. Mr. Samuel Rowland of Mickleover, gives his fatting Cows common Turnips till Candlemas, and Swedes after that.

*Value.*—Three to five pounds have been the usual prices per acre for Turnip Crops, about Foremarke, I was informed, to be eat off on the land.

There exists still, I believe, on the eastern border of the County, a Society, for encouraging by Premiums, the growth of the largest and best Turnips, which, in November 1807, held its annual Meeting at the Swan Inn at Sutton in Ashfield, Notts, and rewarded Mr. William Stanhope for a Turnip, that weighed 20lb. and measured 38¼ inches round the bulb! at the same time that other prizes were adjudged, for Turnips of inferior size.

*Modes of Preservation.*—Mr. James Longsdon of Little Longsdon, has found, that early sown Turnips stand the frosts better than later sown ones, owing, he thinks, to their rinds being properly hardened by age.

Mr. William Smith of Swarkestone Lows, has found his

his Turnips on newly-limed Lands at Foremarke-Park, to hold their colour and keep much sounder in the Winter, than on other Lands.

Mr. Joshua Lingard of Blackwell, pits part of his Turnips, and preserves other parts in Sheds for his Sheep and Cattle in Winter. When the entire rotting of those left abroad has happened, he has not found the succeeding Corn Crops better, but worse, than where the Turnips had been previously eat off by Sheep!

Mr. Joseph Gould of Pilsbury, draws and tops all his largest Turnips, perhaps one-third of the Crop, at the beginning of Winter, carting the tops to the Yard for his young Stock, and the bulbs are then thrown into long trenches, a yard wide and ten inches deep, and others are piled on to these, to the form of a Ridge, three feet high, on to which the soil is thrown and carefully smoothed by a spade: the Sheep then follow to eat the remaining small Turnips, or between the intervals of frost and snow, during which, these long pies are always accessible: Mr. Samuel Rowland of Mickleover, also pits his common Turnips.

Mr. Francis Blaikie, the Earl of Chesterfield's Bailiff at Bradby Park, has since 1801, in the Spring, when it became necessary to plough the land for Barley, drawn the Turnips (Swedes), and spread them on the poorer parts of the Grass land, close enough to touch each other; in which situation they have remained, sound and good, for a month or more, part of them being afterwards removed to other places, as wanted for the Stock, and the rest consumed on the spot. It appears from the 24th Volume of the Transactions of the Society of Arts, p. 671, that a similar idea occurred to a Farmer in the South-Hams of Devonshire, probably about the same time; but he has taken

taken up his Turnips in October (sown early in June), and placed them carefully with their tops on, and roots downwards, on the Grass of his Orchard, where they continued fresh and good till wanted in the Cattle-yard.

## SECT. XIV.—COLE-SEED OR RAPE (*brassica napus*).

THIS vegetable is little cultivated in Derbyshire; I heard only of the following instances, v.z. the Duke of Devonshire at Chatsworth, for Spring feed; the late Mr. Francis Bruckfield at Alton; Mr. Thomas Harvey of Hoon Hay, who continued to sow and feed it off with Sheep, tho' he found it less productive of keep than Turnips; and Mr. George Clay of Arleston, grows two to four acres annually, on Sinfin Moor; sows half a peck of Seed at Midsummer, after paring and burning; begins to mow it in October for Milking Cows.

## SECT. XV.—CABBAGES (*brassica arvensis*).

THE value of Cabbages, in aid of the Turnip crop during deep snows and hard frosts, when the latter are inaccessible, either to the Sheep or to be drawn for other Cattle, is now pretty generally understood throughout the County, as the following List of persons and places, where I saw them in field culture, in some instances to the extent of 10 or 12 acres in a piece, will shew, viz.

Mr. John Berrisford of Shirley, Mr. John Blackwall of Blackwall, Mr. George Bowley of Langley Lodge, Mr. Paul Brentval of Denby, Mr. Robert Brig

Brig of Thurlston, the late Mr. Francis Bruckfield at Alton, the Earl of Chesterfield of Bradby Park, Mr. George Clay of Arleston (for 40 years past), Mr. Samuel Cocker of Ilkeston Hall, Mr. William Cocks of Sandiacre, Edward Coke, Esq. of Longford, Mr. Edward S. Cox of Brailsford, Mr. Robert Cresswell of Iderich-hay, Messrs. Robert and Richard Cresswell of Ravenstone, Sir Henry Crewe, Bart. of Calke Park, Mr. David Dean of Alton in Wirksworth, Mr. Samuel Dean of Wallstone, Mr. Robert Greaves of Ingleby, Mr. William Greaves of Bakewell, Mr. Timothy Greenwood of Newhaven House, Mr. John Holland of Barton Fields, Abraham Hoskins, Esq. of Newton Solney, Mr. Thomas Jowet of Draycot, William D. Lowe, Esq. of Locko Park, Mr. James Matthews of Loscoe Farm, Mr. Thomas Moore of Lullington, Mr. Philip Oakden of Bentley Hall, Mr. L. Ore of Etwall, the Rev. Edward Otter of Bolsover, Mr. Thomas Peat of Kidsley Park, Mr. James Potter of Ilkeston, the Rev. Edward Pole of Radburne, Mr. William Ratcliffe of Stanton by Bridge, Mr. George Bowley of Langley, Mr. John Sims of Stanton by Bridge, Edward S. Sitwell, Esq. of Stanesby, Mr. Thomas Smith of Sedsall in Cubley, Mr. William Smith of Foremarke-Park and Swarkestone Lows, Mr. Alpheus Thacker of Ambaston, Mr. Roger Wall of North-edge, Mr. Wooton B. Thomas at Boythorp, Lord Vernon of Sudbury, and Sir Robert Wilmot of Chaddesden; besides which, I noticed fields of Cabbages at Aldercar in Heanor, Bradley, Langley, Mickleover, North-edge in Ashover, Osmaston, Shirley, Shottle, Twyford, Upper Pilsley in North Winfield, Willington, &c., without learning the names of the owners of them: and doubtless many others escaped my notice or enquiries.

Soil.

*Soil.*—By a reference to the Map, and Chapter on Soils, p. 302 of the first Volume, it will be seen, that the Cabbages cultivated in the places above named, are on very different soils, and yet in almost all instances, the produce seemed well to satisfy the Cultivator. The Rev. Edward Otter, on a newly-drained springy piece of Coal-measures, that had been once ploughed after paring and burning, had a famous crop of Cabbages. On the Coal-measures of Ilkeston, Mr. Samuel Cocker rather complained of the small size of his Cabbages. The only person I met with who had tried cabbages, and entirely disapproved them, was Thomas Hassall, Esq. on the Coal-measures of Hartshorn. The practice of the late Mr. Francis Bruckfield, on the Limestone Shale in Alton, was rather singular, in growing Cabbages 10 years successively on the same piece of Land, in which he told me that he followed the practice and recommendation of Mr. Anthony Tissington of Bonsal, and manured well with stable dung the first year, a smaller portion the next year, and used a very small quantity only, in each succeeding year, and yet found no abatement in the goodness of his Crop, a circumstance which was confirmed to me by Mr. William Wallis, his Bailiff: the Cabbages were pulled up and carted whole to the yard, or pasture selected for consuming them, and not cut off standing as is usual.

*Sort.*—The Drum-head and the Scotch, seemed the prevailing sorts cultivated. Mr. John Blackwall, Mr. Edward S. Cox, Mr. William Greaves, Rev. Edward Otter, &c. cultivate the former; and Mr. Timothy Greenwood, Lord Vernon, &c. the latter sort.

*Time.*

*Time.*—The late Mr. Francis Bruckfield sowed two sorts, one at Michaelmas for early use, and another in the Spring, for use in the suceeding Spring, and transplanted in the middle of May and beginning of June. Mr. William Greaves sows in his Garden, in the latter end of August for his Autumn crop, and transplants in April, at 2½ feet distant every way; and for his Winter crop, sows in March, and transplants in June or July; he draws and carries them to the pastures for his Ewes and Lambs.

Mr. Timothy Greenwood, for his Hand-dale Farm in Hartington, buys large Scotch plants in the first week in June, of Market Gardeners near Derby, and plants them 2½ feet apart, in three feet rows, and moulds them up with the double-boarded plough, first lengthways, then diagonally one way between the plants, and then diagonally the other way, at intervals of a week apart.

Mr. William Smith at Foremarke-Park, sows his Cabbage-seed at Midsummer, transplants in the Garden in October, and plants out in the field, in beginning of the following June.

I heard no complaints of the *Grub* in this County: in the north of Scotland, the coldness of the Spring months is said to cause the roots of the Plants to be eaten off, unless at the time of transplanting, early in April, the roots are dipped in a thin pulp of lime, or in soot and water, which protects them from this insect.

*Consumption.*—It has already been remarked, that Sheep and neat Cattle, during frosts and deep snows, principally consume the Cabbages, and which, Mr. William

William Smith, and many others, chop in pieces when they are very much frozen.

They have been given to dairy Cows, with very good effect on their Milk, by Mr. John Blackwall, the late Mr. Francis Bruckfield, Mr. Samuel Dean, Mr. Timothy Greenwood (in November, &c.), Mr. Thomas Jowet (in Autumn, finding them usually crack'd and damaged in the Spring), William D. Lowe, Esq. Sir Robert Wilmot of Chaddesden, &c.: to fatting Oxen and Cows, by Mr. John Blackwall, the Earl of Chesterfield, William D. Lowe, Esq. Sir Robert Wilmot, Bart. &c. Lord Vernon gives his Cabbages to his Calves and Lambs, from November to April: Mr. William Greaves reserves them for his Ewes and Lambs in April. The Earl of Chesterfield has a machine for cutting the stalks of Cabbages into thin slices, which in that state are readily eaten by the Stock; and Mr. Francis Blaikie, his Lordship's Bailiff, calculates them to contain, one-sixth or one-seventh of the nutrition of the plant. His Lordship gives a portion of his Cabbages to the Deer in his Park.

Mr. William Cox once grew a Field of Cabbages, on Red Marl in Brailsford, that averaged 30 lb. weight each.

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## SECT. XVI.—RUTA BAGA, OR SWEDE TURNIPS.

THIS invaluable Root is very fast spreading, in this as in most other Counties in England. I observed Swede Turnips cultivated, and generally on a good scale, by Mr. Thomas Bowyer of Waldley, the Rev. Joseph Bradshaw of Holbrook, the late Mr. Francis Bruckfield

Bruckfield at Alton, the late Fletcher Bullivant, Esq. of Stanton Ward (who grew no other), the Earl of Chesterfield at Bradby Park (drilled at 20 inches), Mr. George Clay of Arleston, Mr. Samuel Cocker of Ilkeston Hall, Mr. William Cocks of Sandiacre, Edward Coke, Esq. of Longford, Mr. Edward S. Cox of Brailsford (large), Mr. William Cox of Culland, Messrs. Robert and Richard Cresswell of Ravenstone, the Duke of Devonshire at Hardwick Park (in Chatsworth Park, the Hares and Rabbits were found to consume them too much, to continue their cultivation), Mr. John Garner of Walton on Trent, Robert C. Greaves, Esq. of Ingleby, Mr. Timothy Greenwood of Newhaven House, Mr. Francis Hains of Ashburne Lodge, Mr. Richard Harrison of Ash, Mr. Thomas Harvey of Hoon Hay, Thomas Hassall, Esq. of Hartshorn, Mr. John Holland of Barton-fields, Abraham Hoskins, Esq. (grows no other), Mr. Thomas Jowet of Draycot, Mr. Robert Lea of Burrow Fields, William Drury Lowe, Esq. of Locko-Park, Mr. James Longsdon of Little Longsdon, Francis N. C. Mundy, Esq. of Markeaton, Mr. Philip Oakden of Bentley Hall, Sacheverel C. Pole, Esq. of Radburne, Thomas Princep, Esq. of Croxall, Mr. Thomas Rowbottom of Lea Hall, Mr. Samuel Rowland of Mickleover, Mr. Thomas Simpson late of Repton Park, the late Sir Sitwell Sitwell, Bart. of Renishaw, Mr. William Smith of Foremarke-Park and Swarkestone Lows, Mr. Robert Stone of Boylstone, Sir Robert Wilmot, Bart. of Chaddesden, &c.

*Soil.*—Francis N. C. Mundy, Esq. has found his Swedes to produce the most on rather stiff Land, of the Red Marl. On a stiff Coal-measure Soil, recently surface-drained, near Hardwick Hall, I saw a good

crop of Swedes, on the Duke of Devonshire's Farm. At Dethick, on the sandy Debris of the 2nd Rock, they proved small, but only, I believe, for want of earlier sowing and more heart in the Land.

Mr. Timothy Greenwood, sowed Swedes in 1808, on a manured Fallow after common Turnips, on common land, that had previously been pared, burnt, and limed.

Mr. William Smith of Foremarke-Park, sows 2lb. of Seed per acre, in the beginning of June.

Edward Coke, Esq. sows Swedes about the 20th of May.

*Transplanting.*—The excellent practice which Mr. Henry Holland states, in his Report on Cheshire, p. 158, to prevail in that County, and which might remove the only valid objection which I ever heard stated to the general adoption of Swedes instead of the common Turnips (which they so greatly exceed in hardiness and nutritious properties), and which indeed quite unfits them for Slovens, or those who have the misfortune to occupy foul Land, viz. the early period of the Summer at which they must be sown, not allowing of the necessary operations for cleaning of the Land, except in very dry situations or particular seasons, has made but small progress in this County, notwithstanding its great advantages, as to the productiveness of the Crop also*, as I heard only of its being practised

* By the "Communications to the Board of Agriculture," Vol. VI. Part I. p. 230, it appears, that Mr. Cragg of Toft, near Knutsford in Cheshire, in the end of March 1806, sowed his Swede Turnip Seed in a Garden, and in the first and second week in June planted them out in his Field, at 17 inches apart in 27-inch rows, or 17,500 Plants on each statute acre: and that the produce weighed 59,866lb. (or 339lb. each bulb);

practised by Mr. Francis Hains of Ashburne Lodge, who thereby obtains Swedes of a very superior size.

Mr. William Gould of Hanson-grange, having failed with Swedes, for want of being able to sow earlier, was about to try transplanting, when I was there in 1808.

*Hoeing*.—I was not a little surprized, to hear from Mr. Coke's Bailiff at Longford, that twice hoeing of their Swede Turnips, had one year cost 21*s*. to 23*s*. per acre, which I mention, because report had magnified the same to Two Guineas per acre!

*Application*.—When the late Mr. Francis Bruckfield first cultivated Swede Turnips, on his Alton Farm near Wirksworth, they were discovered to be so superior for the Table to common Turnips, that the best part of his Crop was stolen.

The greater part of the Crops of Swede Turnips, are applied here to the same purposes, only later in the season, as the common Turnip, viz. the wintering of Sheep on the Land, and the support, in part, of Cattle on dry Pastures, or in the Fold-yard or in Stalls.

They have been found particularly serviceable drawn and given to milking Cows, by the Rev. Joseph Bradshaw of Holbrook, Mr. Samuel Cocker of Ilkeston Hall, Mr. Richard Harrison of Ash (a scuttleful daily, in Spring), Mr. John Holland of Barton Fields, Mr. Samuel Rowland of Mickleover, Sir Robert Wilmot, Bart. of Chaddesden, &c. Fatting Oxen and Cows have also been fed on them with good success, by Mr. Sa-

bulb); which is 550cwt. or near 26¼ tons per statute acre, besides about 2¼ tons of green tops per acre! Mr. John Lee of Woodhead in Cheadle, Staffordshire, transplants his Swede Turnips into the Field, in May and June.

 muel

muel Cocker of Ilkeston Hall (washed), Robert C. Greaves, Esq. of Ingleby (sliced), Thomas Hassall, Esq. of Hartshorn (sliced), Mr. Thomas Jowet of Draycot, William D. Lowe, Esq. of Locko-Park, Mr. Samuel Rowland of Mickleover, Mr. William Smith of Swarkestone Lows, &c.

Edward Coke, Esq. of Longford, slices all the large ones for the Beasts in his Yards. Mr. Richard Harrison of Ash, draws them for his Bulls which he keeps to let. Mr. Thomas Bowyer of Waldley, gives Swedes to his Horses, and to his Pigs, when boiled and mixed with Barley-meal.

Mr. Blaikie, the Earl of Chesterfield's Bailiff, as described in p. 139, preserves his Swedes good on Pasture Land, till very late in the Spring; and Francis N. C. Mundy, Esq. assured me, that he has kept them, beneficially eatable by Sheep, until the month of June, and altho' Hares and Wood-Pigeons may have bit and pecked them, yet the parts untouched by these depredators, sustains no injury, unless in low and wet situations. It is even asserted (in the "Farmer's Journal" Newspaper for the 23d of December 1811, and confirmed in that of the 13th of January 1812) on the authority of an eminent Norfolk Grazier and others, that nutrition is not even destroyed in these invaluable bulbs, by the ripening of their Seed in Summer, but that when pulled up, they will be found sound, and Horses and other Cattle will feed on them with avidity, and that they have even been served up and proved good at Table! The average Crop, in Norfolk, is said to be 15 tons; worth for the feeding of Horses and Pigs, about 14*l.* per acre.

In comparison with common Turnips, Swedes are stated in Mr. John Bailey's able Durham Report, p. 163,

p. 163, to be eaten by Sheep, only in the proportion of one to one and three-fourths of common Turnips; and, p. 152, that in another Experiment, 19lb. of Swedes, 30lb. of common Turnips, and 17½ lb. of Khol Rabie, were eaten by Sheep of the same size and age, and yet the gain in weight of the Sheep, fed on Swedes and common Turnips was, as five to four, in the course of 73 days, during which the Experiment was continued: the gain by Swedes and Khol Rabie being very nearly equal.

## SECT. XVIII.—KHOL RABIE.

Mr. William Smith of Swarkestone Lows, tried this plant on his Farm, and also on that of Sir Henry Crewe, Bart. at Calke, of which he has the management; where, during three years, five acres of Khol Rabie were cultivated, and resisted the frosts perfectly, but was found to grow slowly, and in the Spring, when most wanted, to have become hollow and stringy, tho' solid at Christmas, and sweeter to the taste than Swede Turnips. Mr. James Matthews of Loscoe Farm, was making a small trial of this plant in 1809.

## SECT. XIX.—THOUSAND-LEAVED CABBAGE.

The Thousand-headed or Tree Cabbage, was cultivated for three years at Swarkestone Lows by Mr. William Smith, and two years at Calke, on Sir Henry Crewe's Farm, and seemed to grow luxuriantly, on different soils, and to stand the drought and frosts perfectly well, making a very showy appearance: the

produce when cut, was found however, very leafy and light, compared either with Cabbages or Swede Turnips: much of the stalks were also left by the Cattle, and required to be raked off the Foddering-ground. Mr. James Matthews of Loscoe Farm, was making trial in 1809 of this Plant, from Seed which he had received from Mr. Tollet.

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## SECT. XX.—CARROTS (*daucus carota*).

THIS excellent root has hardly been sufficiently tried, in field culture, in the County. I noted the following trials or instances of their successful cultivation, viz. Messrs. Robert and Richard Cresswell of Ravenstone, Mr. Joseph Gratian of Belper (in his Garden, see Sect. 1, of Chap IX.), Mr. Joshua Lingard of Blackwell (after Potatoes), Earl Moira of Donnington Park, Mr. Thomas Moore of Lullington, and Mr. Ellis Needham of Hargate Wall.

*Soil.*—Mr. Thomas Moore, on Red Marl, in Lullington, found the soil unfitted for his Carrots, which struck half a yard deep into the fast ground, with roots, many of them, no thicker than a knitting-pin.

*Seed.*—Mr. Joshua Lingard, in 1807, procured his seed from Altringham in Cheshire, and which cost 21*s.* per pound; the crop proved an excellent one.

Messrs. Robert and R. Cresswell of Ravenstone, sow their Carrot-seed in March, and take up and pit the crop in the beginning of November.

*Consumption.*—Mr. Joshua Lingard and Mr. Ellis Needham,

Needham, gave their Carrots to their Horses, with good effect; as do those who purchase Mr. Joseph Gratian's very large Carrots, for their Stallions. Messrs. Cresswell give their Carrots to their letting Tups.

A very excellent paper on the cultivation and uses of this Root by Mr. Robert Burrows, will be found in the Communications to the Board of Agriculture, Vol. VII, Part I. p. 70: his produce was 600 to 700 bushels (of 60 lb. each) per acre.

## SECT. XXI.—BEETS.

THIS family of plants, the Mangel Wurzel in particular, seems richly deserving of a trial in the County, from the success of the Marquis of Salisbury at Hatfield in Hertfordshire, on the London Clay and Sand, where 2650 bushels of Roots, weighing 54 tons, were grown per acre, it is said, from Seed bought of Mr. John Lewis, of No. 74, Cornhill, London. This root has also been highly spoken of lately, by the Norfolk Correspondents, in the "Farmer's Journal."

## SECT. XXII.—POTATOES (*solanum tuberosum*).

THE great advantages of this Root as human food, is well understood in this County, and very ample quantities for this purpose are cultivated by the Farmers, Tradesmen, Labourers, &c. and many cultivate them for the support of their Cattle, among whom I noted Mr. John Berrisford of Osmaston Cottage, Mr. George Bowley of Langley-Lodge, Mr. Thomas Bowyer of

Waldley, the late Mr. Francis Bruckfield at Alton, Mr. Joseph Gould of Pilsbury, Mr. William Greaves of Bakewell, Mr. Timothy Greenwood of Newhaven, Mr. Thomas Jowet of Draycot, Mr. Joshua Lingard of Blackwell, Mr. Thomas Logan late of Buxton (though in a slovenly style), the late Mr. William Longsdon of Eyam, Mr Ellis Needham of Hargate Wall, Mr. William Pickering of Mackworth, Mr. Samuel Rowland of Mickleover, Mr. George Toplis of Brassington, &c. Darley-dale is famous for their culture, and I saw numerous field crops of them, in Alton and North-edge in Ashover, in Ashover, Windley, &c. &c., without learning further particulars concerning them: it is said, that these valuable Roots were first grown at Baslow in the year 1768. Mr. Joshua Lingard draws furrows on a clean tilth, with the double mould-board Plough, at about the ordinary distance of cart-wheels from each other, and about three inches deep, into which, nearly rotten horse-dung is spread, at the rate of 30 three-horse cart-loads per acre; formerly he used a larger quantity, but conceives it had a tendency to make the Potatoes grow hollow. He uses Sets cut from middle-sized Potatoes, about a cubic inch each, and lays them about nine inches asunder on the dung*, and women follow with hoes and

* Davies Giddy, Esq. the Member for Bodmyn in Cornwall, assures me, that much more productive crops are produced by laying the Dung on the Sets, and not under them, as here described.

Very loose Earth is not favourable to the production of Potatoes: in the year 1795, when forming a new Turnpike Road across some grass Fields, between Woburn and Crawley in Bedfordshire, the top-soil was wheeled together into large heaps, and after chopping the same fine on the surface, Potatoes were planted in the ensuing Spring, which produced most thriving plants, but scarcely any Potatoes were found at their roots, in the Autumn.

cover

cover them, with about two inches thick of soil: when the plants have got three or four inches high, the double mould-board plough is used between the rows to earth them up, the Plants are afterwards hand-weeded, and the moulding-up completed, where necessary, by the hand-hoe; about three or four weeks afterwards, the plough is again used, and the moulding up is finished by a shovel.

Mr. Timothy Greenwood of Newhaven, ploughs for Potatoes in the beginning of May, and throws the land into yard ridges, by a double mould-board plough; spreads partly rotted dung in the furrows, at the rate of 14 or 15 three-horse cart-loads per acre, and he sets on this single-eyed cuttings, about 21 bushels per acre, measured before cutting; the Sets being laid single, at five to six inches apart: the double mould-board plough then splits the ridges, drawn by one horse, and covers the Sets: when the Plants are about five or six inches high, generally in July, he moulds them a second time, by the same plough.

Mr. William Greaves of Bakewell plants his Potatoes by the plough, about the middle of May. I saw no Potatoes planted in lazy-beds in the County.

The late Mr. William Longsdon, shewed me a fine crop of Potatoes, growing on the newly inclosed lands on Eyam Edge, from eyes of Potatoes, scooped out by a small sharp instrument made on purpose.

*Sorts.*—The Bomb-rennet or Irish Potatoe, is a good deal cultivated about Ashover; the Red keeping sort by Mr. William Greaves at Bakewell, but the Ox-nobles seem most general in use among the Farmers.

The *Curl* prevailed greatly in this County a few years ago, except in Darley-dale, the seed from whence was

in

in high repute on that account; at present but little mischief is experienced from this disease, and in some places it is now hardly known. Mr. Edward Kirk was of opinion, that high manuring occasioned the Curl*: but it seemed, that some varieties of the Potatoes were more subject to it here than others, the Kidney's in particular: Mr. Crozier seemed to think that those varieties which ripened the earliest, were in general most subject to it: and it has been thought, that planting Potatoes gathered before they were fully ripe, prevented the Curl: and which, Mr. Andrew Knight has stated, may also be prevented, by planting shoots three or four inches long, taken from Potatoes in the Spring, without the Bulbs.

The *taking up* of Potatoes, is done by the plough by Mr. Timothy Greenwood, about the middle of October, when the tops begin to die, and which method is not uncommon with the Farmers; Mr. Joshua Lingard raises his by three-tined forks, in October, a method which most Cottagers and Gardeners pursue.

Mr. T. Greenwood *preserves* his Potatoe-crop in Cellars; Mr. William Greaves, Mr. J. Lingard, and most others pit them, to ward off the frosts.

Mr. Joshua Lingard stated his *produce* at 400 to 600 heaped bushels per acre; and Mr. William Greaves his at 600 bushels. In the Spring of 1787, Mr. George Evans, Sir Joseph Banks's Gardener at Overton, cut a single Ox-noble Potatoe into 64 sets, and dug therefrom in the following Autumn, 64 pecks of Potatoes, which weighed 963 lb. averdupois!

* Manuring for Potatoes in Sutherland, one of the Northern Counties of Scotland, has been found so invariably to cause them to be watery or leprous, *i.e.* full of small excrescences, that the manure is there applied to the crop that succeeds Potatoes.—*Suth. Rep.* p. 78.

In

In 1807, Potatoes fetched only 2*s*. or 2*s*. 4*d*. per bushel, but in the Spring of 1808, Mr. J. Lingard sold his remaining stock at 4*s*. per bushel. It has been estimated, that Farmers can grow and pit Potatoes at 9*d*. to 10*d*. per bushel of 90 lb. each.

Mr. W. Greaves considers Potatoes as an exhausting Crop, and says, that the following crop of Seeds shew it most plainly.

*Application.*—Mr. George Bowley feeds Pigs on his Potatoes. The late Mr. Francis Bruckfield fed his Hogs on Potatoes. Mr. George Toplis of Brassington, feeds Bacon Hogs with boiled Potatoes, Oatmeal, and Cheese-whey. Mr. Timothy Greenwood selects all the small of his Potatoes, previous to housing them, and gives them, boiled with Oatmeal, to his Pigs; Mr. Thomas Jowet of Draycot, gives them to his milking and fatting Cows; Mr. Joshua Lingard, and Mr. John Berrisford, give them raw to their Cows; Mr. Robert Lea of Burrow Fields has discontinued the cultivation of Potatoes, conceiving that they rotted some of his Cows; and he even assured me, that given raw to an incalved Cow, bought of Mr. Princep, they rotted a fine bull Calf, on which he had great hopes, in the Cow's belly.

In the Spring of 1808, Mr. Timothy Greenwood gave two fatting Cows 1½ peck each of Potatoes, daily, with Oats in the Straw, but he don't think Potatoes equal to Turnips, for this purpose. Mr. Thomas Bowyer gives a few to his fatting Cows; Mr. Joseph Gould finds Potatoes of more service to fatting Beasts than Turnips; Mr. Thomas Jowet gives them to his fatting Beasts; Mr. William Pickering gives them to fatting Beasts; and Mr. Samuel Rowland finishes the fattening of

of his Cows annually, with Potatoes clean washed. Mr. Thornhill, blacksmith of Markeaton, in 1806, fatted a Cow on Potatoes, which proved very excellent meat. In the "Farmer's Journal" Newspaper of the 27th of April, and 4th of May 1812, many particulars and references to a great deal of practical information on the consumption of this Root, will be found communicated by Mr. Arthur Young.

At Mr. Ellis Needham's Apprentice-house at Litton Cotton Mill, I saw a very useful machine at work, for washing, and then cleaning Potatoes sufficiently of their skins, before boiling; it consisted of a cone and circular board at bottom of it fixed on an axis, turning vertically in a tub lined with punched iron plate, into the bottom of which, a small quantity of water and some Potatoes were put, and the machine being turned rapidly, by its handle, the Potatoes repeatedly striking the tub by their centrifugal force, were soon washed clean, and stripped of their skins, the dirt and skins escaping below the circular board, as they were detached.

## SECT. XXIII.—CLOVER.

THE *Red* or broad-leaved Clover (*trifolium pratense*) is not extensively cultivated as a separate crop, unmixed with White Clover, Trefoil, Rye-grass, Rib-grass or Hay-seeds in this County, nor are any of these grasses common, as separate crops, under which I shall first notice them, in this and the two following Sections, and then treat of the various mixtures, which I found preferred by different Farmers, for green crops, in a course of aration; their uses in the laying down of

Land

Land to permanent Pasture or Meadow (*i. e.* mowing land), and in the improvement of Waste or Rough Lands, will be further noticed in Sect. 2, of Chap. VIII. Sect. 2, of Chap. XI. and Sect. 2, of Chap. XII.

The above Artificial Grasses, are most commonly sown with a crop of Barley, but instances of their being sown with Oats, and with Spring-wheat, are not wanting, and some even with Autumn-wheat, harrowed in in the Spring, and with Beans. In far the greater number of instances, the Artificial Grasses are mown the first year: the raising of Seed from them, is little if at all practised, as I have not noted a single instance in the County.

Mr. Samuel Rowland of Mickleover, harrows in 15 lb. of Red Clover-seed on his young Wheats, in the latter end of March or beginning of April, to lay one year. The Earl of Chesterfield, for the purpose of varying his course on the marly clay parts of Bradby Park Farm, sometimes sows 12 lb. of Red Clover, with his drilled Barley. Mr. John Webb of Barton Lodge, harrows in 12 lb. of Red Clover-seed, with his Spring Wheat, about the middle of April: Mr. Richard Harrison of Ash does the same.

This Seed is also sown with Barley in a three-years course, by Francis N. C. Mundy, Esq. of Markeaton; with Barley sometimes on his strong old Tillage Land, by Mr. John Blackwall of Blackwall, to lay one year, and then plough and harrow in Wheat; with Wheat harrowed in in the Spring, by Mr. William Jessop, jun. of Butterley, to lay one year; and by Mr. Philip Oakden of Bentley Hall, to mow and plough in for manure. With Wheat or Beans, to lay one year, by Mr. Thomas Brown of Ingleby, &c. Clover has recently

recently been introduced into the mesne or Common Fields of Hollington.

I have been told, that in Cheshire, the sowing of some Garden Parsley-seed (*apium petroselinum*) along with the Clover crop, has been found to lessen its dangerous tendency to hove or cause Cattle depastured on it, to be risen-on or violently distended by wind, and which is there also effected, by a mixture of Ray-grass with it, according to Mr. Holland's Report, p. 180.

Clover Leys are thought by many, to be the best kind of preparation for Wheat: Mr. John Webb of Barton Lodge, finds Clover Lands light and mellow, on the Red Marl, when broken up: and more so after mowing, than feeding of the Clover; their Roots also being stronger, which probably more than compensates, in the manure they produce, for the crop carried off.

Mr. Joseph Gilbert, the Bailiff to Bache Thornhill, Esq. of Stanton in the Peak, finds his Wheats on the Clover leys, more subject to be thrown out by frosts, than after a naked fallow.

Mr. Philip Oakden of Bentley Hall, ploughs in the edish of his Clover, after mowing, about the end of August, and sometimes harrows in Wheat, or lets it lay till Spring for drilling Beans.

I heard nothing in this County of the Lands being *tired of Clover:* in some others, where this complaint has been loud, I have more than suspected, that its failure was principally owing to the foul and exhausted state of the lands, on which it was sown, and that it has often been brought forwards as a pretence, for continuing the excessive repetition of Corn crops, the great bane of Farming in such districts.

The *White* or Dutch Clover (*trifolium repens*), is little

little if at all cultivated alone in the County; Mr. Thomas Bowyer of Waldley, speaks of it, as a thing ascertained by the celebrated Mr. Robert Bakewell, while he was his pupil at Dishley, that White Clover was not so much relished by or found so much to improve Stock as Red Clover, and some other sorts of herbage: Mr. Thomas Lea of Stapenhill thinks, that cattle won't eat White Clover, while they can get at Red Clover or Ray-grass.

Mr. Samuel Rowland of Derby, related to me, that some years ago, a bare-eaten crop of White Clover that had been down three years, in dry hot weather, swelled or hoved four Cows, so that they died, after it had been open a month to 40 Cows, the others of which were not affected. The means of relieving hoven Cattle, will be noticed in Sect. 1, of Chap. XIV. The spontaneous production of White Clover on the heathy Lands or Moors of this District, after a plentiful liming, has less to surprize in it, when it is known, as Sir Joseph Banks has stated to me, that these Plants existed before in abundance, beneath the Heath and other weeds (that won't bear the stimulus of Lime) tho' in so creeping and diminutive a state, as to be with difficulty recognized.

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## SECT. XXIV.—TREFOIL (*medicago lupulina*).

This is little known here as a separate Crop. Mr. John Blackwall, on his cleanest land at Blackwall, has sown 15lb. or 16lb. per acre of Trefoil Seed, the year before fallowing for Wheat, and fed the same with Sheep till the end of May.

Cinque-

Cinquefoil (*potentilla verna*) was formerly cultivated at Higham, according to Mr. Pilkington ("View of Derbyshire," p. 299 and 411), but at present I did not see or hear it named in the County.

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SECT. XXV.—RAY-GRASS (*lolium perenne*).

RAY or Rye-grass, or Bents as some call them, are little if at all cultivated alone in the County, having so strong a propensity to flower-stalk, that a considerable portion of the produce is lost, in useless and unsightly Bents, in most instances; but on Mr. Joseph Gould's Farm at Pilsbury, his excellent mode of stocking prevent it, as will be mentioned in Sect. 2, of the next Chapter.

It is mostly cultivated here on high lands, but is thought to exhaust much in every situation. On strong Red Marl, Mr. John Webb of Barton Lodge, thinks Ray-grass pernicious in making the soil sad and livery, instead of being light and mellow when broken up, as after Red Clover. It is not approved, after trial, by Mr. John Blackwall of Blackwall.

*Rib-Grass*.—Ribwort or narrow Plantain (*plantago lanceolata*), is not anywhere cultivated in the County as a separate Crop, that I heard of, tho' about Rotherham in Yorkshire, not far from this County, such Crops are rather common, I believe.

Common *Hay-seeds* are not here used, but in laying down for permanent Pasture, or for several years at least.

*Mixt*

## *Mixt Artificial Grasses, or Seeds.*

1. Red and White Clover only, viz. Red 6lb. and White 6lb. or 7lb., is sown by Mr. Edward Brown of Ingleby, with Spring Wheat, to lay three or four years.

2. Red Clover, White Clover, and Trefoil. This last seed is in part substituted for the Clovers, when they are dearer, by Mr. Thomas Harvey of Hoon Hay.

3. Red Clover and Rye-Grass, viz. Red Clover 14lb. and Rye-grass 1 peck, sown with Barley, to lay 1 year, by Mr. Samuel Cocker of Ilkeston Hall: Red Clover and Rye-Grass, with Barley, to lay 1 year, in Dethick: Red Clover and Rye-grass, harrowed on Wheat, to lay 1 year, by Mr. William Jessop, jun. of Butterley, &c.

4. Red Clover, White Clover, and Rye-grass, viz. Red Clover 12lb., White Clover 3lb., and Rye-grass 2 pecks, with Barley, to lay 3 or 9 years, by Mr. James Matthews of Loscoe-Farm; Red Clover 10lb., White 3lb., and Rye-grass 1 peck, with Barley, to lay 3 years, by Mr. Matthew Webb of Donkil Pits in Catton; Red Clover 8lb., White Clover 4lb. and Rye-grass 2 pecks, with Barley or Spring Wheat, by Mr. Thomas Harvey of Hoon Hay, the latter Grain being more favourable to the getting in of the Grass-seeds, and don't in general smother the Clover so much as Barley; the same, with Barley, by the Earl of Chesterfield at Bradby Park, Mr. Robert Lea of Burrow Fields, and Mr. Thomas Lea of Stapenhill; Red Clo-

ver 8lb., White 4lb. and Rye-grass 1 peck, with Barley, to lay 1 year, by Abraham Hoskins, Esq. of Newton Solney; Red and White Clover with 2 pecks of Rye-grass, with Barley, by the late Mr. Francis Bruckfield, &c.

5. Red Clover, White Clover, and Rib-grass, viz. Red Clover 4lb., White 12lb. and Rib-grass 2lb. with Barley, to lay 3 or 4 years, by Abraham Hoskins, Esq. of Newton Solney: Mr. Thomas Harvey of Hoon Hay, sows Red and White Clover, and 2 pecks of Rib-grass.

6. Red Clover, White Clover, Trefoil and Rye-grass, viz. Red Clover 10lb., White 4½ lb., Trefoil 2½lb., and Rye-grass 2 pecks, with Barley, to lay 2 years, by Mr. John Pearsal of Foremarke; Red Clover 10lb., White 4lb., Trefoil 2lb., and Rye-grass 2 pecks, with Barley, to lay 6 to 10 years, by Mr. Benjamin Moulsay of Hono Hill; Red Clover 10lb., White 3lb., Trefoil 1½lb., and ¾ of a peck of Rye-grass, with Barley, to lay 2 to 4 years, by Mr. Thomas Moore of Lullington; Red Clover 8lb., White 6lb., Trefoil 1lb., and Rye-grass 1 peck, with Barley, to lay 5 to 7 years, by Mr. Thomas Jowet, sen. of Draycot; Red Clover 8lb., White 4lb., Trefoil 4lb., and Rye-grass 2 pecks, with Barley or Spring Wheat, by Mr. Robert C. Greaves of Ingleby; Red Clover 8lb., White 4lb., Trefoil 3lb. or 4lb., and Rye-grass 2 pecks, with Barley, to lay 3 years, mown every year, by Mr. Thomas Lea of Stapenhill; Red Clover 8lb., White 4lb., Trefoil 2lb., and Rye-grass 1 peck, with Barley, to lay 1 or 2 years, by Mr. John Webb of Barton Lodge; Red Clover 8lb., White 2lb., Trefoil 2lb., and Rye-grass 2 to 4 pecks, with Wheat (the most Rye-grass, on Coal-measure

measure Clays in the Vales, where Clover is uncertain), by Mr. William Smith at Foremarke-Park; Red Clover 6lb., White 4lb., Trefoil 2lb., and Rye-grass 2 pecks, with Barley, to lay 2 or 3 years, by Mr. William Garman of Persal-Pits in Croxall; Red Clover 4lb., White 10lb., Trefoil 4lb., and Rye-grass 1 peck, with Barley, to lay 2 or 3 years, by Mr. Samuel Cocker of Ilkeston Hall; Red Clover 4lb., White 8lb. Trefoil 2lb., and Rye-grass 1 peck, with Barley or Spring Wheat, on Gravelly Loam, by the Earl of Chesterfield at Bradby Park; Red and White Clover, Trefoil and Rye-grass, by Thomas Princep, Esq. of Croxall, and Mr. John Smith of Repton, &c.

7. Red Clover, White Clover, Rye-grass and Rib-grass, viz. Red Clover 6lb., White 6lb., Rye-grass 3 to 4 pecks, and Rib-grass 6lb., with Oats, to lay 1 year, by Lord Vernon at Sudbury.

8. Red Clover, White Clover, Trefoil and Rib-grass, viz. Red Clover 4lb., White 6lb., Trefoil 6lb. and Rib-grass 4lb., with Barley, to lay 1 year, by Mr. John Blackwall of Blackwall; Red and White Clover, Trefoil and Rib-grass, with Barley, to lay 4 or 5 years, by Mr. Isaac Bennet of Over Haddon, &c.

*Cow-Grass.*—A perennial sort of broad Clover (*trefolium flexuosum*), very nearly resembling the common Red Clover in appearance, is sown (with Hay-seeds from the Inns, &c. about Sheffield in Yorkshire) and greatly preferred to Red Clover, by Mr. Joseph Gould of Pilsbury. Mr. Samuel Rowland, who cultivates this Grass at Mickleover, sows 15lb. of it alone, and finds the Crop as large as of Red Clover, and the

 stalks

stalks less (the leaves also longer and narrower, and blossoms of a deeper colour, see Mr. William Pitt's Leicestershire Report, p. 383, and Staffordshire, p. 73), and prefers it greatly, when to lay two or three years; and always feeds it, on account of its not having the same propensity to swell or hove the Cows as Red Clover has: and on which account he mows the latter, and feeds its aftermath with Sheep.

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## SECT. XXVI.—SAINFOIN (*hedysarum onobrychis*).

THIS Plant, sometimes called Ass-sweet, has been tried in the following places in the County, viz. at Barlborough by Mr. Joseph Butler, at Bolsover, at Calke by Sir Henry Crewe, Bart., at Calow in Chesterfield, at Clown, at Glapwell, at Hoon Hay by Mr. Thomas Harvey, at Hopton by Philip Gell, Esq. at Palterton, at Scarcliff by Mr. Matthew Scorer, at Whitwell, &c.

On the Inclosure of the Parish of Barlborough, in 1798, an Allotment from the Common Fields, on the Yellow Lime, came into the possession of Mr. Joseph Butler, after having been sown with seven successive Crops of Corn, in the Open-field state, and exhausted to the last degree: after giving it a good fallowing, he sowed with his first Crop of Corn, 2 quarts of Sainfoin seed and 14lb. of Trefoil per acre, which last died off on the second year, when the Sainfoin plants pretty well covered the ground: and he was advised, by the late Mr. Samuel Peach of the Angel Inn at Sheffield, not on any account to manure, or to feed his Sainfoin with Sheep: and which he had accordingly pursued, for ten years, when I saw it; mowing from it annually one

one Ton and a half per acre on the average, of Hay, of which his Colliery Horses at Norbrigs are remarkably fond; and at that time he was erecting a Chaff-cutter (as observed p. 57), to be worked by Water, for cutting this and all other Provender given to his Horses. The Edish has generally been left to rot on the ground, on account of its extreme poverty, and to encourage the early growth of the next Crop. Contrary to the general opinion, Mr. Butler thinks that Sainfoin succeeds best where the Limestone Rock is most rubbly and crack'd, so as to let its roots down to a great depth, where they find nourishment, accessible by no other plant. In a Quarry sunk in this Field for repairing the Roads, the Roots have been seen one to two yards deep, and near an inch diameter. Mr. B. thinks Clover would be more apt to continue and choak the Sainfoin, than Trefoil, and that Dung containing the Seeds of Grasses and Weeds, and that this as well as Lime or Compost, encouraging the growth of the Seeds or Plants of other kinds in Soil, may assist in the weakening, and ultimate extermination of the Sainfoin plants; as the only symptoms of failure in this Crop were, in particular places where patches of Cocks-foot and other sturdy Grasses, were spreading and choaking it. Hares and Rabbits, he finds, destroy some of the plants, as Sheep would more effectually do, by eating into the crown and letting in the wet, to rot the tap-root: the out-break of small Springs or Quashes, in other situations, quickly destroy these Roots.

Sir Henry Crewe's first trial of Sainfoin, seemed to fail owing to the foulness of the Land: in a second trial on the Limestone near Calke Park, on a clean tilth, it entirely failed, however, in three years; per-

haps owing to the close beddy nature of the Rock there, which could not admit its roots.

Mr. Thomas Harvey, in the gravelly Vale of Dove, had sown 8 quarts of Sainfoin seed with 5lb. of Red and White Clover mixt, per acre, with his Barley after Turnips, in the year that I was there: of his success I am doubtful, owing to the nearness of the Springs to the surface of his soil.

Philip Gell, Esq. on the the 3d Limestone in Hopton, after paring and burning and Turnips, sowed Sainfoin without other Seeds, and fed it the first year, but it quickly failed, altogether.

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## SECT. XXVII.—LUCERNE (*medicago sativa*).

THIS highly valuable Plant, for the soiling of Horses and Stall-feeding of Cows or other Beasts (for it won't bear grazing), is much less cultivated in the vicinity of the Towns, than it ought to be. At Alfreton it is cultivated by the Rev. Thomas Webster, at Bank-Hall by Samuel Frith, Esq. at Darley by Mr. George Oldham (a small piece), at Calke by Sir Henry Crewe, Bart. at Etwall by Mr. John Heacock (sown broadcast on a sandy gravelly Soil).

In 1805, Sir Henry Crewe's Bailiff, Mr. William Smith, sowed an acre of Lucerne in twelve-inch drills: the crop has since been kept clean by hand-hoeing and weeding, and a large produce cut three and sometimes four times in the year, for the Coach and other Horses, who are very fond of it.

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## SECT. XXVIII.—CHICORY (*cicorium intibus*).

CHICORY or wild Succory, seems little known in this County, less than it ought to be, if Mr. Arthur Young's opinion of its merits are well founded: Mr. Pilkington observed it growing wild at Clown ("View of Derbyshire," I. 451). I saw only a single Land of it in cultivation, in the County, viz. ¼*m.* N E of Stavely, as I was going from thence, and did not happen to learn the name of the Cultivator.

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## SECT. XXIX.—HOPS (*humulus lupulus*).

I HEARD of no instance of the culture of this useful Plant in the County, tho' from the luxuriant growth of it wild in the hedges in several places, I doubt not but many of these places are well adapted to its cultivation: I noticed this spontaneous growth of Hops in Belper, Cresswell, Duffield, Great-Wilne, Killamarsh, Little-Wilne, Marston-Montgomery, Mercaston, Pinxton, Roston, Walton on Trent, &c.

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## SECT. XXX.—HEMP (*cannabis sativa*).

I HEARD only of trials of this Crop, on a small scale, in Eckington, and in Mosborough and Overthorp, in the same Parish.

## SECT. XXXI.—FLAX (*linum usitatissimum*).

THIS useful Plant is cultivated, in a small way, in several places in the County, viz. at Alton in Ashover, Beighton, Brassington, Crich, Dronfield by Mr. Thomas Lomas, Eckington by Mr. — Shaw, Hackenthorp, Heage, Killamarsh, Smalley by Mr. Samuel Barber, Whittington, &c. When at Chesterfield, Mr. Wooton B. Thomas informed me, that a short time before, Mr. Shaw above-mentioned, had offered 10*l.* per acre, free of Taxes, for the liberty of breaking up a moist Meadow on the E side of their Town, to grow Flax, for one season.

## SECT. XXXII.—LIQUORICE (*glycyrrhiza glabra*).

THIS Plant is not, I believe, known in Derbyshire, but it may perhaps be proper here to mention, that the Gardens and Fields in which it is so successfully cultivated in and to the west of the Town of Pontefract in Yorkshire, seem situated on the sand or rubble of the Grit-stone stratum, that immediately underlays the Yellow Lime, as mentioned, Vol. I. p. 462, and in different parts of the List of Sand-pits that follows: and which stratum I have had the opportunity, since that Volume was published, of observing at Bardsey, East-Rigton, East-Keswick, and Collingham*, and

* These three last places, and Linton and Sicklin-Hall, being on the western edge of the Yellow Lime, instead of Bramham and Wetherby, as I had, from mistaken information mentioned, in the 1st Volume, page 156.

again

again on the north side of the Wharf River, in Yorkshire. As I rode by the Liquorice fields at Pontefract, I was struck with their resemblance to a nursery of young Ash plants, when about two or three feet high.

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SECT. XXXIII.—CHAMOMILE (*anthemis nobilis*).

THIS Plant is cultivated to a very considerable extent, on the Limestone-Shale and Coal Shales, in and to the S E of Ashover, viz. in Alton, Brackenfield in Morton, Clay-Cross in North-Winfield, Hanley in ditto, Kelstedge, Mill-town, North-Winfield, Overton, Shirland, Stretton, Stubbin-edge, Woodthorp in North-Winfield, Wooley-moor in Morton, &c.

A dry loamy part of the Shale, or a field which has been drained, is chosen for the culture of Chamomile, and clean fallowed, and about the end of March, the roots of an old plantation being dug up and divided into small slips, the same are planted in rows, about 18 inches asunder, and nearly the same distance in the rows: which are from time to time hand-hoed and weeded, until the September following, when the flowers being full blown, the gathering commences, by Women and Children, who kneel or sit on the ground, and catching the flower heads singly between their different fingers opened like a comb, they are torn off, generally without any of the stalk adhering, and thrown into a small basket, with which each is provided. All such flowers as are not fully blown and white, are neglected, and in two or three weeks time the gathering is repeated, and so on at intervals, till frosts happen, and which too often spoil a considerable crop of flowers: in these latter gatherings, they are careful not

to

to take any discoloured or withered flowers. As fast as the flowers are gathered and measured, they are spread out on a dry floor, and shortly after dried properly and slowly, on a Malt-kiln, or one nearly similar, erected on purpose; when they are packed tight into bags, like those for hops, and sent off, principally to the London Druggists.

Three halfpence per peck is usually paid for gathering, eight or ten pecks being a good day's gathering; and they sold in 1810 at 9*l.*; this year at Eight Guineas per cwt. The produce is said to vary from 2cwt. or less, to 6cwt. the average perhaps 4cwt. per acre per annum.

The plants usually stand three years or more, being in the greatest perfection in the second year; after which the crop declines, and the difficulty of keeping the Land clear of weeds increases.

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## SECT. XXXIV.—TEASILS (*dipsacus sylvestris*).

THE Teazel or Fuller's Thistle is not here cultivated for the use of the broad-cloth dressers, as in Yorkshire, but I noticed it wild in the hedges, in Edingale, Nether Thurvaston, Spondon, and other places on the Red Marl, and perhaps on other loamy soils.

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## SECT. XXXV.—SUNDRY CULTIVATED OR USEFUL PLANTS.

*WOAD*, Wold, or Dyer's Weed (*isatis tinctoria*), a plant almost like a Dock in appearance, with yellow flowers,

flowers, is cultivated on a small scale in Beighton and Eckington, perhaps eight or ten tons annually, and is sent to Manchester for the Cotton-dyers. I observed it growing wild in Matlock, West Hallam, &c. Mr. John Parrish, a Cultivator of this crop in the West of England, sent an account of its management to the Bath Society, and from their 12th Volume of Papers, this has recently been reprinted in the Philosophical and Geological Magazine, Vol. 38, p. 328.

*Widow-wort*, Widow-ways, or Woodawes (*genista tinctora*), a small plant almost like Broom, with yellow flowers, greatly infests their old Pastures, and might perhaps be cultivated to advantage, at Hardley-Hill and other places near Sutton-on-the-Hill, on the Red Marl; the Farmers here pull it up when in flower, and dry and sell it to the Dyers. It is said that liming these Pastures destroys it. Weld (*reseda luteola*), see the Nottinghamshire Report, p. 27, is not cultivated here.

*Yarrow* (*achillea millefolium*) is said to be drawn, tied in bunches, and dried for the Dyers, on the Red Marl, between Burnaston and Radburne.

*Valerian* (*valeriana officinalis*) is cultivated at Mill-town and North-edge in Ashover, at which last place Mr. Roger Wall stated, that it is planted at Michaelmas on a clean piece of Land, in rows 12 inches apart, and the plants six inches asunder, which are either procured from the offsets of former plantations, or from wild plants found in wet places, in the neighbouring woods. Soon after it comes up in the Spring, the tops are cut off, to prevent its running to seed, which spoils

it.

it. At Michaelmas, the leaves are pulled and given to Cattle, and the Roots dug up carefully, and clean washed, and the remaining top is then cut close off, and the roots slit down their thickest part at top, to facilitate their drying, which is effected on a kiln, and after which they must be packed tight and kept very dry, or they spoil. The usual produce is about 18cwt. per acre, sold at Chesterfield at about 90*s*. per hundred-weight. This crop is manured in the winter, of which it requires a great deal.

*Elicampane* (*inula helenium*) is cultivated in a small way, at Mill-town in Ashover.

*Lavender* (*lavandula spica*), and Peppermint (*mentha piperita*) were formerly cultivated on a good scale by Mr. Baker in Crossbrook-dale near Litton, where he had apparatus for distilling these, but when I was in the neighbourhood I heard nothing of them.

*Rhubarb* (*rheum rhabarbarum*), is, I am told, cultivated and dried, on the alluvial sandy loam at Welbeck in Nottinghamshire, near to the borders of this County.

*Truffles* (*tuber cibarium*), a subterranean plant used in cookery, are the produce of hedge bottoms and the shades of some trees (but not of Oaks it is said) on the Yellow Limestone, in Barlborough, Clown, Hardwick-Park, Whitwell, &c. I heard of them also, in a similar situation, ¼*m*. S W of Collingham in Yorkshire. They are often accompanied by Morels (*phallus esculentus*) another plant applied to the same uses.

A Catalogue of the indigenous Plants of the County, will

will be found in Mr. James Pilkington's "View of Derbyshire," Vol. I. p. 323, and of those in the adjoining Counties of Leicester, Stafford, and Chester, in their respective Reports. Yokecliff, a steep rough bank, W of Wirksworth, is said to be famous for its variety of Plants; perhaps owing to the peculiar varieties of soils, produced by the many mine hillocks on it, and its warm and sheltered situation.

CHAP.

# CHAP. VIII.

## GRASS LAND.

### SECT. I.—MEADOWS.

THE proportion of Grass Land to that under tillage, is considerable in this County (see p. 94), owing to the high lands in the northern part of it being better adapted to pasture than to the cultivation of Corn, and to the great prevalence of Cheese-making, or Dairying as it is called, in the southern part of the County, and in a degree throughout the whole of it, independent of the reasons which operate generally, throughout the kingdom, to lessen the proportion of Corn Lands, viz. the vastly increased demand and consequent price of Meat (as well as Cheese and Butter), in consequence of a material change in the habits of an increased population, as to the use of animal food, and the great quantities of these demanded by our immense Navy and Army, and our Colonies and Foreign Stations, some of them, and more to the allowing of Corn and Flour to be too freely imported, without duties, that should, in some measure at least, bring their growers in Foreign States to a level with the highly taxed English Arable Farmer. This prevalence of Grass Land in Derbyshire, seems little if at all enforced by the Covenants in the few Leases that subsist, or in the positive or implied terms of letting Farms, as is the case in most of the more Southern Counties, where custom seems to authorise the Landlord, to consider the breaking up of an old Pasture,

Pasture, or even any Pasture that *was such* at the time of entry, however unproductive, without his special consent, as one of the most heinous offences his Tenants could commit: whereas in Derbyshire, the Tenants seem almost universally at liberty, and in the practice of ploughing any and every piece of Pasture on their Farms, in rotation, which they think will be more profitable in that state: the only rule or customary restriction that I heard on the subject was, that one-third of a Farm ought to be left at quitting, in grass, either old or laid down in proper rotation in an husbandlike manner. From seeing the very beneficial effects of this liberty to Tenants, I cannot but strongly recommend its adoption, to the owners of the numerous cold, rough, ant-billy, and unproductive Pastures in the South, so soon as their Tenants shall see their true interests, in not wishing to repeat the White-strawed grain, as they now too generally do, as observed p. 39.

Throughout Derbyshire, the ancient Grass Lands seem to have been all ploughed, at some former periods, even the grassy parts, or White Land as it is called, interspersed among the heathy Common Moors shew traces of the Plough, most of them.

*Meadow*, is a term in this County, applied only to lands that are mown, in distinction to Pastures which are grazed or fed in the summer; and an opinion pretty generally prevails, that it is better to appropriate particular grass fields as Meadows, and to mow them successively, than to change them; according to some, particular grasses come to perfection in Meadows, and others in Pasture, which are alike unfit for the other mode of management; Mr. William Needham of Great Hucklow, related to me, that in 1807 he mowed a Close,

Close, which had been pastured for 10 or 12 years before; the Hay was well got, though cut rather late, yet his Cattle would not eat it; next year he mowed it again, but I have not learned the quality of this crop of Hay. Mr. Joshua Lingard of Blackwell stated, that his small portion of Arable Land, and consequent deficiency of Dung, would not admit of at any time, dunging the whole of his Grass Lands, which in alternate mowing ought to be the case, on which account he preferred keeping particular fields as Meadow. On the contrary, Bache Thornhill, Esq of Stanton in the Peak, Earl Chesterfield of Bradby Park, Mr. Samuel Cocker of Ilkeston, Mr. Thomas Bowyer of Waldley, and many others, apparently on as good grounds, prefer the changing of their mowing and grazing lands. Watered Meadows are mostly mowed continually, but of these and their management and produce, I intend to speak in Sect. 4, of Chap. XII.

*Low Meadows* on Rivers, or Meadows in the usual acceptation of the term in the Southern Counties, have been noticed in pages 133 and 478 of Vol. I. as far as concerns their alluvial subsoils; some of these alluvial flats are very rich Land, those through which the lower part of the River Dove meanders, on the borders of Staffordshire, in particular; to which County nearly one-half of these low Meadows belong; and Mr. William Pitt has accordingly given an account of them, and of the very sudden *floods* (Vol. I. p. 488) to which they are subject, in p. 68 of his Report on Staffordshire, to which I beg to refer. About Hoon-Hay and other places near Tutbury, it is not uncommon to form mounds of earth in each Meadow, two or three yards high, for the Cattle to retire to, in case of a sudden

sudden Flood, which frequently happens in the course of a night, and sometimes when little or no rain has fallen thereabouts. Mr. Thomas Harvey, instead of these safety mounds in the low Meadows, prefers having each field so set out, that a part of it extends on to the gravelly flat that edges these Meadows, somewhat above the height of the floods, on account of the difficulty of removing the Cattle from these mounds, or of supplying them there with food, should the flood continue several days, as sometimes happens. The Grass upon these dry parts of Mr. Harvey's fields, are neglected by the Cattle, and grow sour and coarse, while the lower parts are open, yet they fly to it in time of floods, and subsist upon it, tho' as he observed to me, *they don't much like it*, nor do they afterwards relish the grass that has been flooded, I should think, until rain has fallen to wash it. A better thing for these highly valuable Meadows would be, the Embanking of the entire courses of the river and brooks thro' them, and adopting a combined system of Irrigation and Warping, as I shall take further occasion to mention in Chap. XIII.

In general, the low Meadows of this County are kept pretty clean and neat; I was sorry, however, to observe several striking instances to the contrary, viz. S E of Barton Fields, at Coxbench, N of Ednaston, W of Horsley and Kilburn, S E of Long-Eaton, S of Marston on Dove, S of Milton, S of Repton, S W of Darwent Chapel, (Vol. I. p. 308), &c.

Sedge, or Tussock-grass, (*aira cæspitosa*), abounds in numerous patches in too many of the low Meadows; Docks, (*rumex crispus*), also much prevail here, the seeds of them being brought down from the uplands in floods, floating on the water, and are left in multitudes by the eddies, in particular places, as Mr. John Nut-

tal showed me, opposite to his house in Matlock, near to the Derwent River; Thistles, (*serratula arvensis*), and others, probably also have their Seeds conveyed in the same manner; they prevailed to a most shameful degree in valuable Meadows S of Marston on Dove, at Spineford Brook, N W of Brailsford, &c.; large Batter-docks, or Butter-burs, (*tussilago petasites*), are too common in the low Meadows, on or near to the Limestone, at Pilsbury, as they were also in Grindon and Wetton in Staff., &c. Rattles, Horse-penny, or Penny-grass, (*rhianthus crista-galli*), often abound in Meadows that are too often mown, in Cowdale, Peak Forest, &c., they abound in such situations: Wild Tansey, Goose-tongue, or Goose-grass, (*tanacetum vulgaris*), is troublesome on Sinfin Fen, Markeaton, Bradburne, in Hatton near Tutbury Bridge, in which last place various Manures and Earths have been spread in hopes of eradicating it, but without any effect.

*Upland Meadows*, are sometimes much affected by the earth thrown up by the Worms. Mr. Joseph Smith of Woodfield in Lullington, had his land thus much injured by the Dew-Worms, until he was advised, at such times as they were at work, forming *Worm-casts*, to scatter Barley Chaff, fresh and dry from the winnowing, on the ground, which sticking to the Worms when they next came out, pricked into them, and prevented their return to their holes, until Rooks and other Birds devoured and destroyed them: surely a brood of Ducks would be useful auxiliaries on such an occasion.

The time of *Haining*, laying or shutting up Meadows for Hay, at Stanton in the Peak, is generally about the 1st of April, but sometimes as late as the middle of May.

The

The usual time of *Hay-Harvest*, at Stanton in the Peak, is the first half of August; in Hartington, Buxton, &c., begin in middle of July, and finish before the middle of August. At Hanson-grange, begin usually on 1st of July. In travelling in the N W of Derbyshire, in 1808, I first saw Grass mown on the 28th of June; and in the N E part, in 1809, at Bamford, on the 23d of June. The Hay-time, in many parts of Derbyshire, is considered of more importance than the Corn-Harvest, and is generally called the Hay-Harvest, and often, in the Dairying districts, the Harvest, without other addition.

The usual process of *Hay-Making* seemed to be, first, after the Grass is cut, to spread and shake it well about, all over the field, with forks, which is called tedding*; in this state it continues a day or more, according to the weather; it is then turned with rakes, in small rows or haoks, and is afterwards spread about again, with forks, and so on, until it is sufficiently dry; then it is raked together in straight lines, or winrows, as they are called, and thence it is pitched on to the Carts: in this last process it is sometimes put into quoil or great cocks, about 30 on an acre, to secure it from wet, in the Night, or until it can be carted to the Stack: a precaution that ought never to be omitted, in catching weather, in the Peak Hundreds in particular, where Showers so often prevail in July and the beginning of August: and it appeared to me, on this account, that

* This essential operation is here very well performed, tho' at the expence often of opening and scattering the grass *by hand*. At Earl Mansfield's at Caen-Wood in Highgate, Mr. Isaac Franklin's at Oxgate-Farm in Willsdon, Middlesex, and several others, they have a simple Machine in use, for tedding and turning Hay, which with one Horse does the work of fifteen persons, in these operations.

the Mowing here is often too long delayed, in hopes of a larger crop, until the whole is spoiled, or nearly, after great expence has been incurred in the making of it: if the first fine weather in July were embraced, to cut the Grass, with all expedition, the Rains that too usually fall soon after, would increase the Aftermath, to a much greater degree of profit, than they do the Grass standing for Hay, which has already formed its flower stalks, if not its seed, or that growing up among what is too often fitting for the Dunghill, rather than the Hay-stack, in catching seasons.

In very steep and small inclosures, Hay is not carted, led, or hurried, as they sometimes call it, but carried to the Stack by a method called *Stanging;* a Stang signifying a pole, or long lever; two of which are laid on the ground, at 2½ or 3 feet apart, and a large Cock of Hay being laid upon the middles of them, two Men take it up by the ends of the poles, in the manner of sedan chairmen, and carry it to the side of the Stack, on to which it is pitched by forks, in the usual way. Corn crops, from similar situations are sometimes stang'd.

The *Stacking* of Hay, is generally performed in a very neat and good manner in this County; the sides are generally carried up, rather overhanging for a good height, before the roof commences, and before this is completed, the sides and part of the roof that is finished is pulled by hand, till the surface presents the most regular and smooth forms, of bents and blades of grass projecting outwards, by which, beating rains against the sides are thrown off again, owing to the ends of the Hay bending downwards by their weight, and acting like close thatch: the pullings are used to top up the Stack or Cock, which is quickly thatched; in which

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the best drawn or trussed Wheat Straw is mostly used, and a very wasteful practice, which I saw in Hartington and other places, prevails, of carrying this Straw, often a considerable distance, to a brook or pond side, to be scattered about by the winds and in moving, in order to wet it, and prepare the Thatch-sheaves, Reed, or Yelmes, which are then to be carried back to the stack or building to be thatched, instead of bringing water in pails, water-carts, or tubs in a cart, to the Barn or Straw-yard, and there preparing the Thatch-sheaves, without this waste and loss of labour.

In Sir Henry Crewe's Rick-yard at Calke Park, I noticed a stout frame, or cill of wood, of the exact size of the Hay-stacks, laid on the ground, and within which a floor of faggots was laid, to keep the Hay from the ground; and after the Stacks were built, a cutting-knife was used, to cut the sides and ends of the Stack, smooth down to the face of the wooden cill, and rather over-hanging, for a yard high all round, which is much neater than when the rough ends of faggots, or irregular billets of wood appear under the sides and ends of the Stacks, and excludes much vermin that usually take shelter therein. Mr. John Holland's Hay-stacks at Barton Fields, were also very neatly made up.

Earl Chesterfield's Hay-stacks in Bradby Park, are *ventilated*, by means of upright chimneys in the interior of them: sacks full of straw are placed upright, and the Hay laid and trod round them as the making of the Stack proceeds, until the sack is nearly buried, when it is drawn up a little, and hay laid round it as before: and before the roof of the Stack is commenced, open triangular frames, like three ladders fastened together, of the full width of the Stack, are laid across each of these Chimneys, and the Hay built upon them,

 by

by which means lateral openings, and a free vent for the steam and heated air from the chimnies, are preserved. If the horizontal frames are wanted higher than the eaves of the Stacks, they are laid lengthways of the Stack and open in its gable ends. For want of these precautions in ventilating Hay-stacks, much Hay is over-heated, and some actually fired, especially when it has been wetted, about Matlock and other places.

At Locko-Park, William Drury Lowe, Esq. has a very neat brick and tiled *Hay-Barn*, of thirteen bays, on brick piers, (built with bricks having their corners rounded, see p. 11), and Arches up to the Plates, the openings being brick'd up half their height, with numerous small openings between the Bricks, to admit Air, or allow the escape of the Steam.

At Priestcliff-ditch near Blackwell, and in some other places, I saw the cut faces of Hay-stacks, that were part of them reserved for another Year, covered by a thin coat of thatch, fastened on by straw-bands and pegs of wood, for excluding beating Rains and the scorching heat of Summer; a practice that seems worthy of imitation.

The *Salting of Hay* at the time of stacking it, is practised by Mr. — Mason at Matlock, as I was informed, and had formerly been much practised about Bakewell and Buxton.

At Bakewell Mr. William Greaves, jun. stated his usual *produce of Hay* from the low Meadows by the Wye, at 30 cwt., and from his Pastures on the Hill sides at 18 to 20 cwt. per acre. At Stanton in the Peak, Bache Thornhill, Esq. 40 cwt. on the average from the earlier Grit-stone Soils, and 34 or 35 cwt. per acre from the Shale Lands.

At

At Pilsbury, Mr. Joseph Gould, from the flat Shale Meadows by the Dove 30 cwt. (of 120 lb.) per acre. At Newhaven, Mr. Timothy Greenwood from Limestone Meadows lately improved from the Common, 20 to 30 cwt. (120 lb.) per acre. At Waldley Mr. Thomas Bowyer, on Red Marl 30 to 40 cwt. per acre; in dropping seasons, a good deal more. At Foremarke-Park, Mr. William Smith 30 cwt. of old Meadow Hay, and about the same of Clover, per acre.

*Rowen*, or Edish After-grass, is pretty generally consumed in the Autumn by Dairy Cows, or by Sheep in some instances. At Sudbury Lord Vernon sometimes keeps his Rowen, of Meadows dunged immediately after the Hay is cleared, until the Spring: at Brailsford, Hopton, and other places, I heard also of the keeping of Autumnal Grass until the Spring. Lime is sometimes spread on After-grass, when it has obtained such a height, as to surprise those not used to Liming.

The *Expence of Mowing* Grass may be about 3*s*. per acre in this County, on the average: at Bretby, 4*s*. per acre: at Foremarke-Park 2*s*. 6*d*., with three pints of Ale and one gallon of Small Beer per day per Man; and the same for mowing Clover: at Foremarke 3*s*., with one quart of Ale and a gallon of Small Beer per acre.

The wages for different labour will be further treated on in Sect. 2, of Chap. XV.

Near Over-end in Great-rocks Dale, I saw a Man mowing a small square Field of Grass spirally, beginning with the extremities of the Field, and ending his mowing in the centre.

*Manuring of Meadows*.—At Blackwell, Mr. Joshua Lingard, dungs his Meadows immediately after carrying the Hay, except the season be very dry, perhaps 30 tons per acre. About Butterley, as Mr. William Jessop, jun. informed me, the Mowing Lands on the Coal-measures have the Dung applied to them, which is saved by liming the Corn Lands, yet the general system there, is to grow Corn (Wheat) rather than Hay. At Pilsbury Mr. Joseph Gould dungs his Meadows, as soon as the Hay is off. At Stanton in the Peak, Bache Thornhill, Esq. uses no Dung on his Arable Land, except for Turnips, finding it more profitably applied to his Meadows, and trusts to Lime on his Arable Land. At Sudbury Lord Vernon (except for his Turnip Crop), applies all his Yard Dung, at the rate of 15 to 20 two-horse cart-loads per acre, to his Mowing Lands immediately after the Hay is carried. At Alton, the late Mr. Francis Bruckfield used his Thrashing-barn Yard Dung exclusively on his Grass Lands, and not on his Fallows, on account of the Seeds of Weeds therein, but kept his Horse and Cow Dung separate for the Arable Lands.

At Barton Fields, Mr. John Holland uses a *Compost* of Earth, and Lime from Birchwood-Park, for his Meadows, spread immediately after carrying the Hay. At Foremarke-Park, Mr. William Smith uses Composts of Soil and Dung and Lime, one-third to one-fifth of the latter for his Meadow Lands. At Hoon Hay Mr. Thomas Harvey uses 20 to 40 two-horse cart-loads of Compost per acre on his Mowing Lands, four-fifths Earth and one-fifth Ticknall Lime. At Stanton in the Peak, Bache Thornhill, Esq. mixes Soil and Lime, which lays 12 months and is turned, and spreads it on his Mowing Lands, at the rate of 25 to 30 loads

loads per acre. At Sudbury, Lord Vernon makes a Compost of three-fourths Earth and one-fourth Birchwood-Park Lime, mixed hot in Summer, and turned two or three times in the ensuing Autumn and Winter, which is laid on part of his Mowing Lands in April, 60 to 100 two-horse cart-loads per acre.

At Killamarsh, Mr. Joseph Butler prepares a Compost, of Soil (from the banks of the Rother River) and Dung, for his Meadow Lands. At Waldley, Mr. Thomas Bowyer, in 1809, sloped in the Banks of the Brook by his Farm, mixed it with Lime, and manured 40 acres of his Meadow and Pasture Land therewith: he does not manure in Winter, but prefers the Autumn or Spring, *when the Grass is growing*, not finding the succeeding hot weather prejudicial, if the Dung be well spread immediately, as it then quickly gets covered. Mr. Thomas Harvey of Hoon Hay, thinks frost and cold prejudicial to spread Dung in Winter, and therefore chooses moist and warm weather for manuring; which circumstances seem to me worthy of general attention.

In Plesley, I noticed the thick water from the Roads mended with Magnesian Lime, to be carefully collected into Pits by the Road sides in wet weather, to drop its sediment*, and which, when the Water was dried away from it, was mixed with Dung, as a Compost, by the Farmers.

At Markeaton, Francis N. C. Mundy, Esq. used formerly to make a Compost of Sweepings of the Streets of Derby and Ticknall or Turnditch Lime, for his

* Which probably contained a large portion of *Magnesian Earth*, and which renders the alleged noxious quality of this Earth to vegetative life still more doubtful, than it is said by others to be. See Sect. 3, of Chap. XII.

Meadows,

Meadows, with the best effect; but of late, the Scavengers sell the Sweepings, part to the Farmers about Mackworth, at 6*s*. per three-horse cart-load, and send the remainder southward by the Derby Canal, mixed with Privy Soil.

On the N of Kedleston, I saw Dung mixing with Red Marl, to form a Compost for Grass Lands.

At Measham, I found *Coal-ashes* (so unaccountably wasted in almost every part of Derbyshire), mixing with Lime, as a Compost, for the excellent Meadows in that Parish. At Bradby Park, the Earl of Chesterfield has always a large heap of excellent Compost, in store, for his Meadows, at the rate of 20 three-horse cart-loads per acre, in the Autumn, after Mowing. Coal-ashes, Saw-dust from the Saw-yard, and Charcoal-dust, from the hearths where it is burnt, form the chief ingredients in this Compost: they are shot down on a waste piece of ground, and during every spare hour, the Labourers are employed to sift, turn, and mix the materials in the Compost-yard; a practice highly worthy of imitation in other large establishments. Soil or Earth from banks, Lime, and Dung, are also mixed for Compost, to dress his Lordship's Grass Lands on some occasions.

In Glossop, Mr. James Robinson of Pye-Grove, mixes Peat from the high Moors east of there, with half the quantity of fresh Dung; laying them in layers to heat, and then turns them, and afterwards mixes a horse-load of unslacked Lime with every ton of the mixture, and in October or March dresses his Sward Land therewith, and finds it highly beneficial: his Neighbour, Mr. John Kershaw of Hurst, has done the same for eight years past, and greatly approves it: he also uses the *Shillings* or Husks of Oats, in his Cattle-yard,

yard, with the best effect, altho' these Husks are almost universally thrown away by the Millers, into their Water-course, or set fire to, in order to get rid of them, as perfectly useless.

At Hargate-Wall Mr. Ellis Needham, collects peaty Turves, lays them in heaps for a year, and then mixes them with rather less than half as much hot Lime, which Compost he turns once, and uses it on his dry Limestone mowing Lands.

At Ingleby Mr. Robert C. Greaves has four Fish-Ponds, situate below a very large Wood, the Streams from which bring down great quantities of Leaves and Twigs every Autumn into the Ponds, which about every six years are emptied, and produce a great quantity of Mud, which when dry, is mixed with about one-fourth as much Ticknall Lime; and where but a small quantity of vegetable matter appears in the Mud, some Dung also is added, and with this Compost he dresses his Grass Lands and Seeds, at the rate of 20 three-horse cart-loads per acre, with the best possible effect.

At Bretby the Earl of Chesterfield, in 1801, spread 30 three-horse cart-loads of Mud, soft from a Pond, in a high and dry close of Red Marl, and bush-harrowed it well, after the first frost; and next Summer, gathered 52 waggon loads of good Hay from the Field, whereon the Tenant in the dry season that preceded (and who fed late with Sheep) grew only two loads of Hay.

Earl Chesterfield uses a Frame for containing the Bushes in a *Bush-Harrow* in the most favourable position for brushing every part of the surface, and which has small wheels to its forepart, and admits of being loaded by weights when necessary; and in Spring, at haining or laying the Pastures for mowing, or as soon

after

after as it becomes dry, this is repeatedly used, and then a heavy *Roller*, by which care, his Lordship's Meadows are kept in most excellent condition.

In Sudbury Park, after manuring his Meadow Land in April, Lord Vernon causes the Dung or Compost to be spread, with more than usual care, and to be bush-harrowed, pickt, and rolled immediately with a heavy Roller, by which precautions the Manure is at once incorporated uniformly with the soil.

At Locko-Park, William D. Lowe, Esq. uses a large heavy Iron Roller on his Grass Land in the Spring.

At Stanton in the Peak, Bache Thornhill, Esq. uses a heavy stone Roller on his Mowing Lands, in the Spring; and Mr. Joseph Gilbert, his Bailiff, informed me, that it has been ascertained, that 6 or 7 cwt. more of Hay are thus obtained, than if the rolling be omitted, as has been done on parts of the fields, for trial.

Instead of using the tines of a Fork in beating the Clots or Dung of Cows and Horses, in Pasture, as is universal in the Southern Counties, I saw here, strong iron Rakes, of nine or ten inches long in the head, used for this purpose, and with much greater expedition, and without beating and bruising the Grass, as the Fork tines do, when held horizontal, as is usual.

## SECT. II.—PASTURES.

At Ash, Barton-Blount, &c. &c. on the Red Marl; at Hassop, and half a mile E S E of Ashford, and in Bakewell, SW of Wirksworth, near Ashburne, &c. on the Limestone Shale, and in Measham on the Coal-measures (Vol. I. p. 148, 181, and 303), I observed very

very rich Pasture Lands, and others little inferior in other particular spots.

At Ash, the Meadow Cats-tail or Timothy grass (*phleum pratense*), and the rough Cocksfoot grass (*Dactylis glomerata**) abound in the Pastures.

On the east side of Over Haddon, a hazel loam upon Limestone, is a walled Close, famous for 40 or 50 miles round, for the Summering of Stallions, in which 16 grown ones from different places have been seen together: it is a fine close Turf, in which I noted, that the Crested Dogs'-tail Grass (*cynosurus cristatus*) most abounded, with a few plants of Ray-grass (*lolium perenne*), rough Cock's-foot Grass, a very few of Meadow Cats'-tail Grass, Sweet-scented Vernal Grass (*anthoxanthum odoratum*), Soft-grass or Yorkshire White (*holcus mollis*), &c.

The *Stocking* of Pasture Lands, seems to have been studied with good effect, by Mr. Joseph Gould of Pilsbury, who so manages the Grazing Part of his extensive Farm, that few or no Bents, or Seed-stalks of Ray-grass, Dog's-tail Grass, &c. tho' so much prone to it, are suffered to grow up in them, but the whole surface is eat down, fair and smooth: this he accomplishes by a judicious mixture of Sheep with his Cows, sometimes together and at others alone (see page 85), and Horses, and having some Ley or Joist Cattle, or else temporary purchased ones, to follow after these as often as they are changed from one Pasture to another, which is very frequently done.

Mr. Thomas Harvey of Hoon Hay, don't mix Sheep

* In the Staffordshire Report, p. 71, it will be seen, that Mr. S. in 1796, gave a character of this Grass, which has since been so fully verified by Mr. Coke and others in Norfolk.

with

with his Dairy Cows, conceiving that they eat the best Grasses, and thereby lessen the produce of Milk from the Cows, altho' well aware of their important use in rendering Pastures fine, uniform, and neat: he also thinks, that the seeding of Grasses in the Tussocks in Pastures, as they are very frequently stocked, or in very late Meadows previous to mowing, does not injure the Land, more than mowing itself does.

The evil of having very different Soils in the same Pasture, is often seen in this County, by observing one part of a Field close fed by the Stock, while the other is growing to Bents and Tussocks, and much Fog or late Autumn Grass is refused by the Stock, and left: the Limestone Shale Lands, stocked by Horses in particular, are eat close in the Autumn, but they leave the Fog on the Limestone Lands, if both of these soils occur in the same Field.

The opinions of some few individuals having been pretty strongly expressed, on the comparative profits of Grazing over those of Dairying, that so much prevails in this County, I have been at some pains to collect the quantities of Cheese made by a Cow annually, on the average of their herd, by as many of the Dairy Farmers as I had the opportunity, and which particulars will be given in Sect. 1, of Chap. XIV.—Mr. Francis Bradshaw of Newton-grange, tho' he thought Dairying rather more profitable on cold Lands, and those of inferior quality, than Grazing such would be, yet he believed, that on Lands that would fatten an Ox, like some of his, the case was otherwise.

*Dairy Grounds*, or those appropriated to Cheese-making, prevail very much on the Red Marl, and on the Mineral Limestone Soils numbered 3, 8, and 9, in the

the Map facing page 97, of the First Volume, and as will be seen by the details in Sect. 1, of Chap. XIV.

It seems a very general opinion, that old Sward answers better for Dairying than Artificial Grasses, or Lands newly laid down, tho' clean and luxuriant in their growth, and even, that the best and fattest Cheese is made from inferior Land, according to some. There seemed in too many instances a neglect of weeding and dressing the Cow-Pastures, that much surprised me, particularly in Findern, Longford, Stenson, Sudbury-Park, and E of it, Trusley, Twyford, Weston-Underwood, &c. In mentioning the most prevailing *Weeds* of these Pastures, I shall begin with,

*Thistles* (*cardua*, *serratula*, *soncha*, &c.) of several sorts, which are justly the reproach of Derbyshire Farming, in almost every corner of the County; and tho' nothing is more common with the Farmers, than Nostrums for their destruction, consisting principally in the particular times or manner of mowing or spudding them: I could not help observing, from the plentiful crops of these intruders on their lands, that the remedies must have far less efficacy, than was pretended, or that the relators were culpably remiss in applying them. It seems almost the general opinion, that liming produces Thistles spontaneously; it seems, however, far more likely (as I shall further observe in Sect. 3, of Chap. XII.) that Lime acts as a stimulus to dormant seeds and fibres of the roots of Thistles, in the manner that it does to White Clover (see page 159) and other plants probably, tho' in less remarkable degrees. Too repeatedly, the Thistles are left to ripen and disperse their Seeds on the Pastures, before cutting them, and in the mawn Lands before mowing time,

and

and the pleas of want of time, scarcity of Labourers at the proper juncture, &c. are as often repeated, as the evil is reprobated.

Mr. Joshua Lingard of Blackwell stated to me, that Thistles are best destroyed by leaving them alone, until in flower, and the stems are hollow, and then mowing them close down, and that the Cattle will afterwards eat the Grass cut up with them.

Mr. Thomas Harvey of Hoon Hay stated, that if the Pastures on the borders of the Dove are mown for two successive years, it weakens the Thistles in them essentially, and so does mowing the Thistles in the Pastures, at the same season.

Mr. Joseph Gould of Pilsbury, sometimes mows the hard Thistles close, when almost ripening their Seed, and immediately carries them off into a Pit, and applies hot Lime to them; at others, he spuds the Thistles earlier, before the Stock are taken out of the Pastures, in order that they may eat up the tussocks of Grass that grew round them.

Mr. Francis Blaikie, Bailiff to Earl Chesterfield at Bradby Park, sends Men out into the adjoining Public Roads and Lanes, to mow down all the Thistles when in flower, or rather before, and repeatedly spuds the Thistles which appear in his Lordship's Park and Farm.

Mr. William Gould of Hanson-grange, don't spud Thistles till the middle of June, as early spudding causes them to tiller, or throw up several stems, he says.

Bredsall Common-field, Haddon-field, Hill-top in Mellor, Riddings *, &c., exhibited shameful examples of

* If any thing could excuse the Farmers for the Crops of Thistles and Rushes, &c. here seen, it might be the *Tenure* under which these Lands are held, that has been mentioned, Vol. I. p. 351.

of this weed in full seed at the times I saw them: and the same by the sides of the new Turnpike Road in Windley, to the no small disgrace of the Surveyor and acting Commissioners: in Barlborough I saw many of these noxious weeds in the Lanes, and on my suggestion, Mr. Joseph Butler engaged to bestir himself with the Parishioners, to get a person appointed to mow them down, and continue to do so in succeeding Summers, at the Parish expence. On the N W side of Hague in Eckington, I saw a young Plantation of considerable size (that had been foul Arable Land, I suppose) one entire bed of Thistles, in seed! At Kinder, I saw a complete Field of Thistles.

*Docks* (*rumex crispus*).—This noxious weed too much abounds, and too often is allowed to increase its roots or spread its seeds, without molestation; when collected out of Grass or Corn Crops, or in weeding, they are too often thrown into hedge bottoms, where they still grow and propagate, instead of being burnt, buried too deep to survive, or taken to a compost heap, and buried there in hot lime. Mr. Thomas Harvey of Hoon Hay stated, that Sheep, by being hard stocked upon Pastures, will exterminate Docks; but the practice of Earl Chesterfield, and many other good managers, who draw them as often as they appear, seems more sure, and worthy of recommendation.

*Yellow Ragwort*, Swine-grass, Dog-wort, or Stinking Anny (*senecio jacobæa*), is seen in many dry pastures in this district, where Sheep are not kept; but usually disappears after one summer feeding with this stock. In Twyford it much abounds: in Cawton Leys and Haddon Pastures, near Bakewell, &c.

*Nettles* (*urtica dioica*) are not unfrequently found troublesome, near to walls in the Limestone district: at Blackwell, Mr. Joshua Lingard destroys them, by mowing them down when in flower, and their stems are hollow.

*Fern*, or Brackens (*ptaris aquilina*), is troublesome in some sandy Pastures, Parks, &c.

In Chatsworth Park, Fern was destroyed, and a good Herbage produced in its place, by a dressing of 260 bushels of Lime per acre, on Shale Grit. In Bradby Park, Fern on a loamy soil is destroyed by mowing twice in the Summer repeatedly, and rolling afterwards with a heavy roller, which produces a kind and good herbage. In other parts of this Park, where the Fern is suffered to continue, it is mown in the end of September, and stack'd, for litter in the Cattle-yard, when dry.

*Wild Thyme* (*thymus serphyllum*) abounds a good deal on the Limestone Pastures, in the Peaks, and on the Red Marl in some places, as at Culland, Radburne, &c., particularly where much trodden, and becomes a rank shrubby plant.

*Rosams*, Ramsons, or Wild Garlick (*allium ursinum*), is a plant greatly resembling the Lily of the Valley in its Leaves at one period of its growth, which greatly infests some Limestone Pastures, particularly under the shade of Trees, and gives a garlick-like flavour to the Butter of Cows which eat of it: but it is said, that Butter from Dairy Farms where this does not too much abound, is preferred in Sheffield Market to other Butter: I saw a great deal of this weed in Matlock Bath Dale, and in Loxley Close in Ashover, &c.

*Hard Irons*, Clob-heads, or least Knapweed (*centaurea*

*taurea nigra*) is a rough, unsightly weed, that much disfigures the Dairy Pastures of this County, on loamy and strong soils, as Cows seem to leave it, to form its seed-stalk: but stocking hard with Sheep in the Spring will, it is said, weaken and destroy it. On the Toadstone Soils, this plant is often seen, and it abounds on the Red Marl, in Edlaston, Trusley, Weston-Underwood, &c.

*Thorny Restharrow*, Hen-gorse, or Fiend (*ononis spinosa*), is a disagreeable prickly weed in some Pastures; on the Red Marl, I noticed it at Culland, Handley-Hill in Sutton, Radburne, Trusley, &c. Sheep hard kept upon it, are said to destroy it.

*Rushes*, or Sives (*junci*) of different sorts, prevailed much more a few years ago in the County than they do at present, before the laudable exertions in Draining, that will be noticed in Sect 1, of Chap. XII., had been made; the Coal Shales seem particularly subject to this weed, and in many parts, fields that were not very sensibly too wet in an arable state, soon became covered with Rushes at the furrows, and the same soon by neglect crept up the sides of the lands to the very Ridges, in many situations: Draining is a sovereign remedy, though a slow one in some situations, against these intruders, which Ploughing effectually banishes. Frequent mowing of Rushes will weaken and destroy them: quick Lime spread immediately after mowing Rushes very close, so that it may fall into their tubes, will quickly kill them: Mr. Francis Blaikie of Bradby Park, breast-ploughs rushy patches very thin, when the surface is slightly frozen in the Autumn, and strews hot Lime for more effectually and quickly destroying the Roots of the Rushes.

*Mosses* (*musci*), of several sorts, prevail among the Grass, where rolling and hard stocking with Cattle and Sheep have been long neglected: harrowing and liming such Pastures, has a good effect towards their extermination.

*Cowslips* (*primula veris*) are too often seen in great numbers, on cold and rather poor Pastures, where draining and liming would often remove them.

*Daisies* (*bellis perennis*) are found often in company with the last; the Coal Shales, when newly laid down to Pasture, seem rather subject to this beggarly weed.

*Butter-cups*, or Upright Crow-foot (*ranunculus acris*), too often give a golden hue to the Dairy Pastures, without adding any thing to their value, but occupying the place of valuable Herbage: this plant seemed to me to indicate previous mismanagement and exhaustion, in some new Pastures E of Hill Top in Mellor.

*Dandelion* (*leontodon taraxacum*) appeared to me much too common, among many other *broad-leaved* Plants, in the Pastures of this County (that I shall pass over), to all of which I profess myself an enemy, from having carefully compared the early crops, wholly composed of *Grass*, properly so called, in the neighbourhood of London, and in particular spots in other places, and noticed how much heavier a burden will grow on the same space, with what regularity Grass is eaten up in Pastures, and with what facility and ease the same is made into green and fragrant Hay, when compared with the medley of Plants, many of them positively noxious, that are so common, and which

abound

abound with such broad and fleshy leaved Plants, as if kept in the Field till properly withered and cured, the Grasses are dried up, and materially diminished and injured: and on the other hand, if the Hay be carried as soon as the Grasses are fit, most of these broad and thick leaves turn black, mould in the stack, and greatly injure the whole crop.

*Sheep Pastures* in this County present little for remark, as except perhaps the Woodlands of Hope, and some of the neighbouring Moors, few, if any Lands are exclusively appropriated to this stock: and *Sheep Walks*, or any of the Rights or antiquated Claims of this kind on the Estates of others, which so greatly delay improvements in many of the Southern Counties, are wholly unknown here, I believe.

*Ley*, Joist, or Summer Pastures.—Thro' a considerable part of the Limestone tract in the Peak Hundreds, it is very common for the Farmers to set apart large Pasture Fields, for the taking in of Summerlings or Joist Cattle, at fixed Prices per Week, and find a Herdsman to look after them. Gentlemen's Parks are also thus applied, in some instances. I noticed these Leys, as they are called, in Brassington, Brushfield, Carsington (Pastures), Castleton, Cawton in Bakewell, Chatsworth-Park, Doveridge-Park and Meadows, Great-rocks, Hardwick-Park, Hartington, Kedleston-Park, Markeaton-Park, Over Haddon, (Stallions, see p. 189), Peak Forest, &c.

On Brassington Common, the Commissioners for its Inclosure, in the Summers of 1806 and 1807, (as mentioned p. 80) took in Ley Cattle, at prices per head, from the 12th of May to the 11th of October, as under, viz.

 Horses,

| | £ | s. | d. |
|---|---|---|---|
| Horses, aged | 1 | 15 | 0 |
| —— two and one year old | 1 | 5 | 0 |
| Beasts, two year old | 1 | 5 | 0 |
| —— one year | 0 | 15 | 0 |
| Sheep, barren | 0 | 3 | 0 |
| Sheep and Lambs to Midsummer, with an additional charge for Lambs afterwards | 0 | 4 | 0 |

In the following year, 350 acres of this Common, when allotted, belonging to one Proprietor, was used as Ley, for the same period, and at the following prices per head, viz.

| | £ | s. | d. |
|---|---|---|---|
| Horses, aged | 3 | 0 | 0 |
| —— two year old | 2 | 10 | 0 |
| —— one ditto | 1 | 15 | 0 |
| Beasts, two year old | 1 | 15 | 0 |
| —— one ditto | 1 | 5 | 0 |
| Sheep, barren | 0 | 5 | 0 |
| Ewes and Lambs to Midsummer | 0 | 6 | 0 |

At Doveridge, Lord Waterpark had, previous to 1808, seeded down all the Land in his own occupation, and took in Ley Milking Cows, of the Cottagers and others, at Four Guineas per annum, from the 12th of May to the 19th of September.

At Markeaton, Francis N. C. Mundy, Esq. takes into his Park the Ley Milking Cows of the Tradesmen and others in the Town of Derby, at Five Guineas per head, from Old May-Day to Old Michaelmas-Day. These Cows are of various Breeds and degrees of goodness, and form excellent contrasts with his own 25 improved

improved Dairy Cows that graze with them, as Mr. Richard Parkinson has observed, in his Rutland Report, p. 122.

At Longford, Edward Coke, Esq. takes in Heifers at Two Guineas a-head, from May-Day to Old Michaelmas.

At Kedleston, Lord Scarsdale's large Park, and 200 acres of Pasture S and S W of it, are used as Ley, and his Bailiff, Mr. Joseph Brooks, takes in neat Stock from May-Day to Michaelmas: the prices were, two-year-olds 25*s*. and yearlings 21*s*., but the prices are now raised considerably.

On the Farms in Castleton and Great-rocks Dale, year-old Colts pay for Summering 50*s*. to 84*s*., two-year-olds 3 to 5 Guineas, and aged horses 6 to 7 Guineas; yearling Calves 25*s*. to 40*s*., two-year-olds 35*s*. to 50*s*., and feeding Cows 60*s*. to 70*s*. per head.

In Fisherwick Park near Tamworth in Staffordshire, the charges were, from the 20th of May to the 7th of October,

| | £ | *s*. | *d*. |
|---|---|---|---|
| Horses, two year old | 3 | 10 | 0 |
| ——— one year | 3 | 0 | 0 |
| Beasts, Heifers | 2 | 10 | 0 |
| ——— Yearlings | 1 | 10 | 0 |

*Laying Land to Grass.*—At Newhaven, Mr. Timothy Greenwood, on newly broken up heathy limestone Land, after Turnips, sowed, with Oats, Red Clover 6lb., White Clover 6lb., Trefoil 4lb. or 5lb., Ray-grass 1 bushel, and Hay-seeds 4 or 5 bushels per acre; after two years, this Ley was dressed with 12 or 13 score bushels of Lime per acre.

At Pilsbury, Mr. Joseph Gould, with Oats, uses

lately Cow-grass (*trifolium flexuosum*) instead of Red Clover, with White Clover, Ray-grass, Rib-grass, and about eight bushels of Hay-seeds per acre, in laying down his Limestone Lands; and in the succeeding Autumn manures the Ley.

At Barton Fields, Mr. John Webb uses, with Spring Wheat, Red Clover 4lb., White Clover 6lb., Trefoil 2lb., Rib-grass 3lb., and Hay-seeds 8 bushels, obtained from the Inns in the Peak Hundreds.

At Stanton in the Peak, Bache Thornhill, Esq. sows, with Wheat, harrowed in, in May, White Clover 8lb., Trefoil 4lb., Rib-grass 7lb. or 8lb., Hay-seeds 16 bushels, and he feeds these Leys three years before mowing.

At Hargate-Wall, Mr. Ellis Needham, with a second crop of Oats, sows White Clover 6lb., Trefoil 6lb., Hay-seeds 16 bushels, obtained from the Inns at or near Chesterfield.

At Blackwell, Mr. Joshua Lingard, with a second crop of Oats, sows White Clover 8lb., Trefoil 4lb., Chesterfield Hay-seeds 12 bushels (that contain much Ray and Rib-grass seeds, and cost 16*s*. per quarter), per acre: if intended for meadow or mowing, the Seeds are fed the first year, and in the Autumn, he lays on 120 bushels of Lime per acre, and dung also slightly: if intended for pasture or grazing, the Seeds, as soon as the Corn is cleared, are limed at the rate of 250 to 280 bushels per acre; the Lime burnt on his own Farm.

At Mickleover, Mr. Samuel Rowland, after a clean fallow, sows Wheat, ploughs the Stubbles at Michaelmas, and in Spring sows Oats, and with them White Clover 6lb., Trefoil 5lb., Rib-grass 5lb., and good Hay-seeds one bushel per acre, for laying five, six, or more years.

At Great Hucklow, Mr. John Radford, ploughed very

very poor heathy Common Land in the Spring, and let it lie fallow through the Summer, then well limed it, and sowed it in the Spring with Grass-seeds alone.

In King's Sterndale, about 1805, Mr. Thomas Pickford ploughed heathy Limestone Land, about three inches thick, limed it with 450 bushels per acre, and next Spring sowed White Clover, Trefoil, and Hay-seeds, without Corn; it was done for his Tenant on the west side of the Village, and when I saw it in 1808, was a good Pasture.

In several parts of the Limestone tract in the Peak Hundreds, Pastures have been continued in that state, until they had become mossy, and partially covered by heath, the ploughing of them being delayed, under an idea of the extreme difficulty and slowness of again swarding this Land; I am inclined however to think, that much of this has arisen from excessive cropping, and the repeating of White Grain, previous to seeding them down, and that with a better system, there is no necessity in any case to suffer the reappearance of the native Heaths and Mosses, which were so much the disgrace of these Districts a few ages ago, or of continuing worn out ploughed lands in a series of unproductive cropping, from a fear that they won't, after a proper course of husbandry, lay down to profitable Pasture. Mr. George Wood of Buxton, in 1809, laid down 37 acres in a manner so satisfactory to the Manchester Agricultural Society, that they awarded him a Seven-guinea Silver Cup, as a Reward and encouragement to others. New Pastures, in these parts, are much subject to Black Twitch or Kessel (*avena elatior*), as observed p. 100: on the Yellow Limestone Soils, on the east side of the County, such are still more prone to Shar or Pry Grass (*festuca pinnata*), as observed Vol. I. p. 304,

p. 301, it also abounds on particular spots of the other Limestone Soils, as on Crich Cliff.

On the Coal-measure soils, the new Pastures seemed pretty generally fed. I observed an exhausted cold close of Land under Seeds on the S W side of Carr House in Wingerworth, almost exclusively covered by *Fiorin Grass*, or creeping Bent-grass (*agrostis stolonifera*), which seemed but too truly to answer to the account which Mr. William Pitt gives of it in the Staffordshire Report, p. 72; and in the shortness, and meagre, and withered appearance of its creeping stalks and thin leaves, little to resemble the long and thick stolons of this Grass, which Dr. William Richardson sent over from Ireland to the Editor of the Agricultural Magazine, No. 1, Paternoster-row, for public inspection, and for distribution; much less did it seem to produce, in any degree, as he represents it to do, in the moist climate of the sister kingdom. As the Cattle seemed in a great measure, if not entirely, to disregard and refuse this creeping Grass, I strongly recommended the Tenant, Mr. John Grattan, to try the mowing, or raking of it up and drying it, late in the Autumn, and to give it to his different stock in the Winter, as Dr. Richardson recommends.

I heard of no attempts to cultivate this Grass in the County, or to give it a trial on Land under a fair state of management and fertility; on such as are *exhausted* by cropping, or naturally very steril, we have the authority of the Rev. John Dubourdieu, the able Author of the "Statistical Survey of Antrim," where Dr. Richardson's Farm is situate, in saying, that it does not answer; its produce being just as beggarly, as in the case I have mentioned. This is however no argument against its utility on Bogs, its proper sphere apparently.

*Breaking*

*Breaking up Grass Land.*—At Blackwall, Mr. John Blackwall, when intending to break up old Turf in July or August, lays on 120 bushels of Wirksworth Lime per acre, well spread; and after a shower has fallen, pares broad with a Plough, half an inch thick, turning the Turf as completely as possible, and after the first rain, he rolls, and in the Spring following, uses a Plough with a sharp circular coulter (as the common one would drive the sods) for ploughing and turning the surface to the ordinary depth, as completely as possible, and then immediately harrows in Poland, Holland, or Short-white Oats; his Stubbles he pares, and carries off the Straw and Roots to his Fold-yard (see page 125); the second crop is usually, Barley, after one ploughing, rather deeper than the last, to turn up the Lime.

At Hanson-grange, Mr. William Gould ploughs up the roughest of his Dairy Pastures, and sows Oats for two or three years, then fallow and Turnips; to which Oats and Grass-seeds succeed, for permanent Pasture.

At Ash, Mr. Richard Harrison occasionally ploughs his roughest Pastures, on the Red Marl, with the skim-coultered Plough, takes two crops of Oats, then fallows and dresses with 96 bushels of Crich, or 140 bushels of Ticknall Lime per acre, for Turnips; then Barley or Spring-wheat, which last he prefers, and Red Clover, then Wheat, fallow, and Swede Turnips.

At Blackwell, Mr. Joshua Lingard, when his Pastures of 15 or 20 years ley, were grown mossy, used to plough them and take two crops of Oats, then fallow, and dress with 150 to 210 bushels of Lime, and 20 three-horse cart-loads of Yard-dung per acre, for Turnips, then one or two crops of Oats, and sow Grass-seeds with the last of them for Pasture again, as mentioned

tioned above: but from often finding the second Oat Crop, after coming up promisingly, after the Turf, and even after fallowing, dunging, and Turnips as above, to die off, owing to the spongy hollowness of the soil, which was very sensible to the foot in walking over it, he now pares or flotes and burns his old Leys, limes for Turnips, and sows Oats, and then Oats and Grass-seeds. Many other instances of paring and burning rough Grass Land, will be mentioned in Sect. 2, of Chap. XII.

Grass Lands being unprotected by Leases on the custom of the county, as observed p. 174, of course the payment of particular Rents for permission to break them up, are rarely known; I heard of but the one instance mentioned p. 168, of such an offer, and that was for growing Flax.

# CHAP. IX.

## GARDENS AND ORCHARDS.

### SECT. I.—GARDENS.

DERBYSHIRE, generally reputed to be so inhospitable a climate, but without sufficient reason, as has been shewn p. 95, of Vol. I, can boast of perhaps as great a proportion of large walled and well stored and kept Gardens, as most of the Midland and Northern Counties, some few of which, that I have had occasion to note, are the following, viz. at Bradby Park the Earl of Chesterfield; where Oak and Spanish Chesnut Leaves, collected in the Autumn, are used and preferred to Tan, for heating the Pinery: at Chatsworth the Duke of Devonshire; here the Gardener, the late Mr. Ralph Trevis, kept a Rain-gauge, and his successor does the same, a practice which is recommended for more general adoption in the first Vol. p. 103, where the details of this Register of Rain for the last 50 years are given: at Eggington Sir Henry Every, Bart.: at Hopton Philip Gell, Esq.: at Kedleston Lord Scarsdale: at Leam Marmaduke M. Middleton, Esq.; here I saw a large and curious Pear-tree, which by passing part of it through a hole in the wall at six feet high, was trained to every aspect on the walls adjoining: at Little Hayfield Entwistle Hague, Esq.: at Newton Solney Abraham Hoskins, Esq.;

Esq.; a Hot-house here 153 feet long, 17 wide in the centre, and 13 at the ends, of the most perfect construction, was stored with 16 sorts of Pines, and 24 sorts of Grapes, in full bearing: at Radburne Sacheverel C. Pole, Esq.: at Sutton in Scarsdale Clement Kinnersley, Esq.: at Weston on Trent Mrs. Walker; and a Hot-house: at Willersley Richard Arkwright, Esq.: at Wingerworth Sir Thomas Windsor Hunloke, Bart. &c.

Garden Walls having oval niches between the piers for fruit-trees, instead of straight and plain Walls, are to be seen in the Gardens at Hopton-Hall, and others nearly similar in the Rev. Richard Ward's at Sutton-on-the-Hill. I did not observe any Walls inclining northward at top, to occasion the Sun's rays to strike the Wall and Fruit-trees more perpendicularly than on upright Walls.

At Overton, in the Gardens of Sir Joseph Banks, Bart., there is an old Gooseberry-tree, of the small red sort, rather rough and prickly, trained against a north Wall, the east branch of which, extended in September 1808, 28 feet 7 inches, and the west branch 22 feet 7 inches, covering a Wall 51 feet 2 inches long, and six or more feet high! In 1794, another was planted by a Wall, with a west aspect, and at the period above named, had spread 21 feet 1 inch in S, and 20 feet 4 inches N, or extending 41 feet 5 inches, and both of these trees continue still to bear abundantly. Mr. George Evans, the Gardener here, told me, that Green Gooseberries might be obtained early in the season, by this training them against Walls: and they are said to be more certain to bear when so trained, see Mr. John Holt's Lancashire Report, p. 82.

At

At Hargate Wall, Mr. Ellis Needham has built his Garden Walls much taller than usual, and with very good effect, in so bleak a situation.

At Stapenhill, I saw in Mr. Thomas Lea's Garden, a very simple and economic Garden-seat, such as I had before seen in Sir Joseph Banks's Park at Revesby in Lincolnshire, of which I thought it worth while to preserve the Sketches that are given in Plate IV. facing page 67, where fig. 5, shews the Seat as in use, and fig. 6, the manner in which part of the Seat *a a*, and back-board *b b*, turn up over, and form a roof, to keep the remainder of the Seat *c c* dry, and preserve it from the moss and filth, which wood exposed to the rain soon acquires. In case it should be found that birds or vermin harbour on and dirt the board under the roof, triangular pieces of boards can be fixed on to the ends of the roof, which won't much incommode the Seat, particularly a long one for several persons, to which this construction is well adapted, and this might also act as a brace to the back-board, and render the upright *d d* unnecessary; and in this case, a lock might be placed at one or both ends, for preventing the careless or mischievous leaving of the Seat exposed to rain; and therein a cushion might be kept, to render the Seat more agreeable, or in situations in Parks, &c. adapted to view prospects, a Telescope, and Explanatory Map or Book, &c. might occasionally be left in safety, under the roof, as by making a projection *e*, that might pass freely into a cavity *f*, in the two parts of the joint, and making the triangular ends to overlap the ends of the fixed Seat *c c*, rain and snow would be effectually excluded; and the key-hole of the lock might in such case, be under the end of the Seat, and quite out of sight. If greater height of back-

back-board be wanted, it is plain that it may be had, as shewn by the dotted lines in figs. 5 and 6. When a considerable height of back-board is wanted, the roof form may be dispensed with altogether, and by a proper division of the seat-board, it may be made to shut up as shewn, in an end view, in fig. 7.

In the Garden of William Hunter, Esq. at Kilburne, I saw the only remaining instance that I noted, of the prevailing taste of the last age, for clipping Yew bushes into regular or fantastic shapes.

The Farm-houses are well supplied with Gardens, in general well kept; and Tradesmen and Cottagers are seldom without them, except some in the Towns and larger Villages.

Several well managed *Market Gardens* are established at or near to Alfreton, Ashburne, Belper, Chesterfield, Darley in the Dale, Derby, Litchurch, Littleover, Measham, Melborne, &c. and from their great use and accommodation to the surrounding neighbourhoods, ought to be more generally encouraged.

Samuel Oldknow, Esq. of Mellor, keeps a professed Gardener, on three acres of rich sheltered land by the River Goyte, on the Cheshire side of it, who cultivates, gathers, prepares, and delivers, all the useful Vegetables and common Garden Fruits in season, to his Cotton-mill Work-people and Tenants, and renders an account once a fortnight to the Mill-Agent, who deducts what they have purchased from the Garden, from their several wages: the perfection and utility of his arrangements for these purposes, cannot but prove highly gratifying, to those who wish to see the labouring class well and comfortably provided for, from the fruits of their industry. Proper rooms, for drying, cleaning, and preserving Garden-seeds and Fruits,

and

and his Wool-chamber and other like Offices, are attached to the Gardener's House, and placed under his care.

The most productive Market-Garden that I ever saw or heard of, is that of Mr. John Gratian of Belper, a Tenant of Messrs. Strutts', who in planning and setting out the new Town which has arisen, in consequence of their extensive Cotton-mills, on the steep side of a hill, on the edge of the 1st Coal-shale, forming a poor Yellow Clay Soil, which was previously cropped with Oats principally, contrived common Sewers from the several Yards, Pumps, Wash-houses, Privies, &c. with a view to collect and render the rich liquid Manures from them useful, and these (from 50 Cottages) centre in a Cess-pool in the upper end of Mr. Gratian's Garden, and whence he runs it in small Trenches, during the Winter, over every part of the Beds, intended to be planted in February or March with early Dwarf or Yorkshire *Cabbages*, which in May and June prove uncommonly large and fine: a little before cutting the Cabbages, early varieties of *Potatoes*, about the size of Walnuts, and kept till then from shooting, by keeping a few together, not too dry or moist, and often moving them, are planted in the spaces, between the Cabbages, and grow most rapidly, even those planted at Midsummer: the tops of them are nipt off, before blooming, and about the end of October, they are fit to dig up, and are preserved in Cellars, one of which he was constructing under his Oven, being also a Baker, but this probably would be found too warm and dry a place, for such purposes.

On other Beds, prepared first in Winter as before, Mazagan and Windsor *broad Beans* are planted in February, in four feet rows, three inches apart, and con-

trived not to be opposite: when the Beans have been hoed and earthed up, the thick water is turned into the Trenches between them, after which the spaces are dug, and *Brocoli* planted in them, for early use next Spring. In May the Beans are topped, when in flower, and prove uncommonly productive: about the end of July the Bean Crop is off, and the Brocoli Plants are then earthed up, and a Trench formed between their rows, which is watered at intervals, during the ensuing Autumn and Winter, and in February, after digging the spaces, Beans are again planted in them, as above; and thus have particular Beds been managed, for seven years past, producing two most abundant and valuable crops.

Other Beds are watered in Trenches in the Winter, and dug in February or March, when Sandwich *Carrots* are sown, and set out by the hoe, to six inches asunder; and afterwards, others are drawn for early Carrots, so as to set the remaining crop out to nine or ten inches asunder, which in August and September are dug for sale, weighing 2lb. and 3lb. each, and are in high request, by all but a few individuals, who having heard of or seen Mr. G.'s mode of manuring, have more exquisite feelings than palates. The Carrots intended for Winter-keeping, stand till November, and acquire a most amazing size, without tendency to hollowness, and are stacked with their interstices filled with dry Sand, in a dry Out-house. Those who keep Stallions come far and near to purchase these in the Spring, usually at 5*s*. per cwt. for their best Horses.

On other watered Beds, *Scarlet Beans* are planted about the 1st of May, in four feet rows, and three inches apart, being first made to sprout by soaking in

water

water in a Warm Room, and taking care to place the sprout downwards, without which precaution they are apt to rot: the watering proceeds in Trenches between the rows, and digging of the spaces occasionally, during the Summer. The Beans are well and carefully stick't, and bear most abundantly, from the end of July until frosts occur.

Of Egg *Pease*, he sows only one row in a place, as they grow eight or nine feet high, if well stick't; the produce was astonishingly great, when I saw them on the 1st of December, 1809. From November to Midsummer, he sows at intervals, different sorts of Pease, and gathers large crops from June to October: of the Scotch Dwarf Pea he raises Seed, for the London Gardeners.

Spanish or Reading *Onions* are sown in February or March, on Beds watered in the Winter, and prove highly productive.

*Cucumbers*, of the long and short prickly kinds, are grown in holes, filled with Soil and Dung; sown in the end of May, and the gathering continues from the end of July till frosts occur.

Some vacant Beds (or spaces between crops in rows) are always left, for using the Water upon in the Summer: a Scoop is used to throw the Water over vacant Beds above the level of the Cess-pool, and Pails to carry it to the upper end of Trenches, where it cannot be made to run to them.

I was concerned to find, that the situation of this most productive Garden, which is almost in the middle of the increasing Town of Belper, had occasioned it to be repeatedly lessened, for erecting new Houses on its skirts, until become almost too small to use the whole of the increasing quantity of rich liquid Manure

that flows to it, or to employ the whole attention of this very ingenious Horticulturist: and I venture to suggest, to those public-spirited and ingenious individuals who own it, and most of the place, that it would be worth while to look out for a sufficiently roomy spot without the Town, below the level of this and the other Sewers (if practicable, as I think it is), for a new Garden, and to extend the Sewers, with proper Puddle or Water-clay under and at the sides of them, after they got on to porous soils, to prevent the soaking away of the valuable liquid Manures which they contain, and having a sufficient fall in every part, to prevent the stagnating and dropping the grosser parts of the fluid, until it reaches the new Garden Cess-pool. If any one would form an adequate idea of the immense loss to the Country, by the emptying of the Sewers of London, and other large Towns, into the Rivers, they should certainly visit Mr. Gratian's Garden, and witness its extraordinary products, on one of the most unfavourable soils for Gardening, that can well be found.

Mr. Ellis Needham of Hargate Wall, practises the transplanting of *Onions*, when they are about the size of Goose-quills at bottom, at proper distances from each other, and finds the bulb thus obtained, larger and finer than from the original Seed-bed: on which subject I beg here to mention, that Mr. Thomas A. Knight, has published in the Horticultural Transactions, Vol. *I.*, his practice in raising this useful Root, of the Portuguese or Spanish kind; which is, to sow the Seed very thick on a poor soil, under the shade of a Tree, by which treatment they become no larger than Pease in the first year; these are pulled in Autumn, and next Spring are planted at proper distances in a good

soil,

soil, where they attain to five inches or more in diameter, and are equal to the best imported Onions. Altringham in Cheshire, supplies some of its large produce of Onions and Carrots (see Mr. Holland's Report, p. 166), to the western parts of this County, I believe.

At Chatsworth, I ate of black Spanish *Radishes*, a large root, sliced with Oil and Vinegar, as Cucumbers are served up. I heard of no Celery Show in this County, like that at Manchester, where in November last (1811), a Root weighing 6 lb. 4 oz., and several others nearly as large, were exhibited; or of Gooseberry or other Fruit or Flower Shows, as in several other Districts are common, and are found useful, for promoting attention to the best varieties of cultivated Trees and Plants. Mr. Cornelius Brough of Langley Meynel (or Kirk), was mentioned to me, as a Florist of some note.

*Water-cresses* (*sysimbrium nasturtium*) abound greatly in many of the smaller Rivulets and Brooks, where the Springs from the Rocky Districts find their vents, but they seem less used at the Tables here, than their pleasant and wholesome nature entitles them. The Seed of this Plant, procured at the Shops in London, will enable any Person to raise it, wherever there is a constant stream of clear Water, however small, by conducting it over a shallow channel paved with pebbles, between which the Seeds are to be sown, and where they will soon spread and produce a complete Crop, if not too much disturbed by the treading or browsing of Cattle.

The growth and productiveness of *Strawberries* has been found, by Mr. William Fenton of Rothwell-haigh in Yorkshire, to be surprisingly promoted by a dressing of the marly blue Bind, mentioned in Vol. I. p. 446, as

as found in the 9th Coal-shale, in numerous places in this County, of which Boythorp, there mentioned, is an instance.

*Raspberries*, are here subject to Insects on their leaves, which the steam of quick Lime, spread under them when they appear, has been found to destroy.

*Rose Bushes* were formerly cultivated at Mill-town in Ashover, for their Flowers, but I saw no Fields under this culture at present. On the south of Dronfield, on the 9th Grit Rock, I saw a kind of small red Rose in a wild dwarf state, that is, I think, not very common.

*Virgin's Bower*, or other beautiful flowering Creepers, and Shrubs, and Plants, are not uncommon at the Cottage-doors in this County, among other indications of their attention to neatness and of their comforts, compared with the inhabitants of the miserable Huts, in many other Districts.

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## SECT. II.—ORCHARDS.

The planting of Orchards in this County seems much neglected, particularly in the Red Marl Districts, where many spots occur, apparently not less favourable for their growth, than in the famous Cider Districts in Herefordshire and Worcestershire, on this same stratum: yet I heard of no instance of Cider or Perry being made in the District. It has been found at Pilsbury, by Mr. Joseph Gould, and in other places, that Apple, Cherry, and other Fruit-trees on the Limestone Shale, appear to do very well for a few years, while their roots principally occupy the surface, or vegetable

vegetable soil, but afterwards when they come to strike into the shale, they soon dwindle, and often die entirely.

The Rev. Thomas Astley of Chesterfield, had some *Pear-trees*, on the Coal-measures, which were unproductive, but have been made to bear, by taking off a narrow ring of Bark quite round their trunks: said to be a Lancashire practice, by Mr. John Holt in his Report, p. 83.

The Trunks and Branches of *Apple* and Pear Trees are too often suffered to become very mossy and foul, and pruning is too commonly neglected, which, together with the want of cultivating new varieties, not worn out by age, as grafted Fruit-trees are very apt to become, has, I think, alone occasioned the idea of Orchards not being profitable, on proper loamy soils, in sheltered situations, in this and several other Counties. *Misletoe* (*viscum album*) too often infests the Branches of Apple and Pear Trees, Thorns, Limes, and some others: this parasitical Plant has been thus observed, in Allestry, Barlborough, Chatsworth, Cresswell, Elmton, Hardwick, Hassop, Long Duckmanton, Pinxton, West Hallam, &c.

*Plumb* or *Cherry Trees*, are rarely seen here in any numbers; I saw Cherry-Orchards only in Derby, Fenny-Bentley, and Hackenthorp, I believe: there are some Black Cherry Trees in Pinxton, I am told.

*Walnut Trees* (*Juglars regia*) seem greatly on the decline, the very great price of its Wood for several years past, and which is still advancing, having induced great numbers to cut them down, without its having stimulated as many Persons to cultivate and plant them in the same period, which, when the beauty of their Foliage, and the value of their Fruit, and their com-

P 4 parative

parative quick growth, are considered, seems not a little surprising; especially as they seem to thrive well in most parts of Derbyshire, where Gardens or Orchards are to be expected: at Ash in Sutton, I noticed very large Walnut Trees, and in Bakewell at Holme Hall; they were also growing at Beighton, Foremarke Hall, Heanor, King's-Newton (large), at Newton Solney (planted by Abraham Hoskins, Esq.), Overton, Whaley, &c.

*Mulberry* Trees (*morus nigra*) seem also not ill adapted to the situations above alluded to, tho' I only noticed them in Eckington and Hackenthorpe: Silk-worms are, of course, little known in the District.

*Elder* Trees (*sambucus, nigra, & alba*) or black and white berried, have been spoken of as the produce of Hedges, in p. 90; at Bradby-Park the Earl of Chesterfield has a large Grove of the black-berried Trees, the Berries of which are preserved for the Pheasants in the Autumn and Winter, when fallen, tho' these Berries are stated in the Staffordshire Report, p. 214, to be poisonous to Poultry: in most other situations, these Berries are gathered for making *Elder Wine*, a useful and cheering article in cold weather: this brings me to mention another made Wine, which is far less common in England than the above, viz.

*Birch Wine.*—An open Grove of about 100 common Birch Trees (*betula alba*) growing near to Overton Hall, the seat of Sir Joseph Banks, Bart. in Ashover, have for 60 or 70 years past been appropriated to the making of Wine, from their juice or sap; being tapped about once in three years, 30 or more in a season. These Trees are now about twelve inches diameter at the ground, on an average, and are very tall, with

rather

rather small heads, as they stand pretty close, and don't seem injured in their health by the process, or in their Timber more than half a yard above the ground. The Tapping commences in the beginning of March, unless there is frost then, to endanger the breaking of the Bottles, used to catch the juice: a Carpenter's gouge and mallet are used, to cut out a piece of the Bark about one-half or three-fourths of an inch diameter, at about six or eight inches above the ground, a part being chosen where the Bark appears thickest, and the Gouge being made to enter the Wood a short distance: several small hollowed pieces of Iron about four inches long, that are represented in fig. 8, of Plate IV., facing page 67, being in readiness, one of them is carefully driven into the Bark, just below the hole, inclining downwards, observing not to drive it *through* into the Wood, or the operation would fail: a common quart Glass or Stone Bottle, is then slipped on to the end of the Iron, its bottom resting on the ground, as represented in fig. 9.

If the weather proves warm, the holes soon gum up, and cease to run in four or five days: in favourable and windy weather, they will run for a month: some Trees will run two gallons in 24 hours (the Bottles being often looked to and emptied), and others not half a pint, the average about one pint per day: such trees as run but little at the beginning of the season, are tapped again in a fresh place, before the leaves expand: one Tree has produced 30 to 40 gallons in a season, during the last seven years. Various schemes have been tried, without success, to stop the running when the gathering of the juice is discontinued, on the appearance of the Leaves: frosty nights will suspend the running.

The Birch Water is principally sold at 6*d*. per gallon,

lon, to those who make small Wine for use in their families, instead of Small Beer.—The Water should not be kept more than three days after it is collected, in warm weather, or six or seven days in cool weather, lest it putrify and spoil, unless the Water is scalded (without bringing it to a boiling heat) daily, as it is collected, when the Wine-making may be deferred for a month after beginning to collect the Birch Water.

For making the Wine, 2lb. of coarse Sugar and ¼lb. of Malaga Raisins, are added to every gallon of the Birch Water, when cold: it is then boiled for about an hour, until it is observed to grow clearer, when it is set to cool, and when about at the same heat that Beer is set to work, a Toast of Bread spread with Yeast, is put into it, and for four days it is suffered to work freely, when it is barrelled, and the same quantity of Raisins as before, and about an ounce of Isinglass to every 20 gallons, are added: it seldom works out of the Barrel, and in two or three weeks is ready for close bunging down, to remain for three months, when it should be bottled off, and in two or three weeks after it is fit for drinking, but is better for keeping longer.

Other made Wines, principally of Currants, are not uncommon with the good Housewives of this County. The Rev. Francis Gisborne of Stavely, has been famous for the very old Ale and Wine with which he occasionally treated his Friends, the former of 70 years or more since it was brewed: some of his Mountain Wine, particularly well corked, that had been standing erect for more than 50 years, was found still in perfection.

CHAP.

# CHAP. X.

## WOODS AND PLANTATIONS.

### SECT. I.—COPSE WOODS.

SPRING WOODS, as those are here called which bear Underwood as well as Timber, and are cut at stated periods, are well distributed throughout this County, except on the Mineral or Peak Limestone District, and the Shale and Coal-measure District to the North of it, as will appear by the following List of Places, where I noted ancient Woods, principally of Oak, but often with a mixture of Ash, Sycamore, Elm, Beech, Poplar, Alder, Spanish Chesnuts, and a few other Trees; and Underwood, consisting for the most part of stems of Oak, Ash, Nut-hazel, Birch, Sallow, &c.

Abbey-Dale, E
Alderwasley, E, large
Alt-Hucknal
Alton in Ashover, E
Ashford, W (brush)
Barlborough, N, large
Barlow, N E, large
Beauchief
Birchett, E
Birkin-lane, N E
Bonsal, S (brush)
Brackenfield, W
Bradley, S
Bradway, W
Brampton, N
Brentwood Gate, N E
Bretby, S W
Burrow-hill, S (Walton Wood, small)
Calke
Callow in Hope, N
Chatsworth, E
Chisworth, N, small
Church Gresley, N, large
Cotman-Hay, N
Cowley, E

Crich,

Crich, S (the Chase)
Cutthorpe, S
Dale Abbey, S and N E
Darwent Chapel, N N W (Ronksley, &c.)
Denby Hall
Donnington, W
Doveridge, N (Eaton Wood, &c.)
Eagleston, N W
Eckington, N W
Edingale, N E, small
Foston, N E, small
Gamesley, N
Glossop, S E (Shire-Hill)
Great-Rowsley, N E and E
Griffe, S and E (brush)
Hackenthorp, S (Hanging Lee)
Haddou Hall
Hay-side, W small
Henge, N W (Thackerhay)
High-low
High-Oredish, N E (Clatter-coats)
Holmesfield
Killamarsh, N E
Kinder, N W
Lea, W and S W
Leam, E
Lightwood, S E
Little-Moor, N, small
Locko-Park
Ludworth, small
Lydgate, S W (Smathly)
Mackworth, W
Melborne, S
Middle Handley, N E
Middleton by Wirksworth, N (brush)
Morley, N
Morton, N (Padley), large
Mosborough, S W (Hanging-Lee, &c.)
Nether Padley, E
Norton Leys, N E
Oaks in Norton, S E
Overton, S, small
Plesley, E, large
Reninshaw, S W
Repton (Foremarke Wood *), large
Rowlee, N W
Scarcliff, S E
Sheldon, N
Shirley, N W, large (Park)
Slaley, S (brush)
Smalley, E, small
Smithsby, N W
Spinkhill, E
Stanton Lees, W and N
Stubbing, W
Sudbury, N
Sutton in Scarsdale, W
Swaithwick
Tibshelf, E
Ticknall, N (Knowl-hill), large
Toadmoor, N
Troway, N W

* These fine Woods were under the care of Mr. James Mathews from 1735 to 1755, when great attention was paid to the training of the Trees; and since to the present time, his Son Mr. James M. of Loscoe Farm, has continued the management of them.

Upper

Upper Padley, E
Walton in Chesterfield, W, large
West Handley, S W
Whaley, S W
Whittington, N W and N E
Whitwell, N and N E, large
Willersley, N W
Willesley, N W
Williamsthorpe, N
Wingerworth, W (Hardwick, c.) very large
Woodseats in Norton, W and N E
Woodthorp, W and S E
Wormhill, S E, small,

As in noting these Woods, and describing them on my large Map of the County (see Vol. I. p. 15), I was not always able to ascertain within which Parish or Township the whole or some parts of them are situated, I have preferred in the above List mentioning the Villages, or nearest assemblage of Houses, having a Name, and the general bearings of the Spring Woods from them, as by reference to the Alphabetical List of all these, in the Preface to the present Volume (or the Parochial Lists in Vol. I. p. 78), it can be seen, in what Parish and Hundred any such places are situate.

The greater part of these Woods, appear to be very ancient, and few, if any of them, have been planted within a Century past, and yet large Trees are very rare in them, as might be expected, by those who observe and consider how destructive such are to *Underwood* (especially where pruning has been neglected), which by its frequent and considerable return, in most situations, is found more profitable than Oaks, or any other Trees, suffered to stand in such Woods longer than 50 or 60 Years at most, owing to the very inadequate prices given for *large* Timber, as will be further noticed in speaking of open Groves of Oak or Timber Trees. If in any situation, Underwood was comparatively of less value than large Timber, it might be expected to be so where Coals or Peat abound, and the

Inhabi-

Inhabitants place no dependence on the Underwoods for Fuel, which latter is the case throughout Derbyshire, and not, as was universal through many of the Southern and Eastern Counties, previous to the late extension of Canals, from the Coal Districts or Ports into them, and still is to a great degree the case in such Counties, where the Fuel of the Inhabitants, and for burning of Bricks and Lime, &c., is almost entirely derived from the Underwoods and loppings of Trees and Hedges; yet in this County, as well as in those situations, almost every Proprietor of Woods seems by his conduct to have been practically convinced of the impolicy of growing *large* Oaks or other Trees in his Spring Woods, however well the soil or situation may be adapted to them.

The Spring Woods in Derbyshire are in general well Fenced against Cattle, always with Stone Walls, where this material is near at hand, and with good Hedges and Ditches in most other situations: I cannot, however, say much in commendation of their management, as to that most essential article of *pruning* and training up the young spires, so as to have clear bodies, without any Boughs till out of the reach of the Underwood: pruning having been either almost generally neglected in Woods, or attempted on the *large* arms of Trees fit to be felled, in some few instances, as I observed with concern, in some Woods on the South side of Chesterfield; but on this subject I intend to speak more at large at the end of the Third Section of this Chapter.

Almost throughout Derbyshire, the principal appropriation of the Underwood is to *Puncheons*, or Supports for the Coal-Pits (see Vol. I. p. 347), and for which purpose the Underwood requires to stand from 21 to 28 Years old, or about 25 Years on the average; the *Stemples* and Fails used in Lead-Mines, and the

Ladder-

Ladder-shafts, Soughs, Gates, &c., leading thereto (Vol. I. p. 368 and 371, &c.) occasioned also a very considerable demand for stout Underwood Poles, until within a few years past, when the Mines have so much declined: the smaller *Poles* find a vend for making *Fleaks* or Hurdles, for *Broom-sticks* and *Hedge-stakes*, and other similar uses, and nearly all the remaining Underwood and Lop of the Wood Trees, are cut into Cord-wood, and converted to Charcoal near the spot.

The Woods in this County are principally, if not entirely, in the hands of the Owners, managed by their Agents or Bailiffs, tho' often the Wood is valued previous to sale, by professional Wood-valuers *; of course *Rents* for Wood Lands are here little known.

The Duke of Devonshire, the Duke of Portland, Sir Thomas Windsor Hunloke, Bart., the late Sir Sitwell Sitwell, Bart., Francis Hurt, Esq., and others of the principal Proprietors of the Woods above mentioned, divide their Wood Lands into 24 or 25 nearly equal parts, or falls, one of which is cut every Year, so that by the time the last Fall is cut, the first will be ready to cut again, and so on in succession, by which means the Colliers and other consumers, are supplied with nearly equal quantities annually, and the Owners can also reckon upon nearly as regular an annual income from their Spring Woods, as from any other equal extent of their Estates that are let in Farms: great fluctuations in the prices of Puncheons and other articles, and of Oak Timber in a degree, are also thereby prevented.

Mr. John Gratton informs me, that Falls of Spring

* Mr. John Gratton, Jun. of Carr House in Wingerworth, is a good deal employed in this way, and so is Mr. John Green of Whittington.

Woods,

Woods, of 25 Years average growth, within moderate distances of the Collieries, are worth from 40*l.* to 100*l.* per acre, clear of all expences of Fencing, Draining, and Superintending, as well as of valuing and selling (Tithes, Taxes, and Parochial Rates being only excepted, on account of their very variable amount), 65*l.* or 70*l.* being about the average, where the larger Oaks from 60 to 100 feet measure fetch 3*s.* 6*d.* to 5*s.* 3*d.* per foot, and the smaller ones 2*s.* to 3*s.* 6*d.* per foot. That the reserves left standing, are from 15 to 20 Trees and Poles, and from 50 to 80 Wavers or Saplings, on each acre, varying in value from 30*l.* to 50*l.* But to be more particular, he selected several Woods of a medium soil and value, and found on an average, that there were left on each acre after the last Falls, 55 Wavers of 25 years growth, 13 Black-barks of 50 years growth, 5 Heiriors of 75 years growth, and one Timber Tree of 100 years growth and upwards, and which together were found worth 40*l.* per acre on the average, at the time of leaving them; and the probability is, that at the end of 25 years the whole crop will be worth 110*l.*, so that 70 poundsworth may be cut down, and 40 poundsworth of Crop left standing on each acre, as before: this sum, as the produce of a 25 years Fall of an acre, I have reason to think rather too large, from having been assured by a Gentleman, who has extensive and excellent Woods in the County, and paid rather less than 15*d.* per acre for Tithes and all Parochial Taxes for his Woods, that the same produced him only 65*l.* 17*s.* 6*d.* per acre net, at a cutting, on the average of many years; and from which he deducted 50*l.* for the simple Interest at 5 per cent. on his 40*l.* always laying dead in the Crop, and shewed me, that this divided by 25, gave him only 12*s.* 8½*d.* per acre per annum

num for his Wood Land, though great part of it was tolerably level, and not greatly inferior in quality to the surrounding Arable and Pasture Lands. It appears to me, however, that this is a very unfair statement of the annual produce of these Wood Lands, for putting them on a par with Agricultural Lands (tho' less so than rejecting Interest altogether, as some have done); and that Compound Interest on the delayed Rent, or increase of Wood, ought to be allowed: suppose it first, only at 3½ per cent., to bring it to a par with buying Land at 20 years purchase, and it appears, that the Interest of the 40*l.* laying dead, will at the next Fall be 50*l.* 15*s.* 11¼*d.*, which taken from 65*l.* 17*s.* 6*d.* leaves 15*l.* 1*s.* 6¼*d.* in lieu of the Rent of the Wood Land Acre, forborne 25 years, and this we shall find to be only 7*s.* 11*d.* per annum, in the way of Rent! But had we calculated on 4 per cent. Compound Interest, that on the dead stock would be 66*l.* 12*s.* 8*d.*, exceeding the cuttable produce, at the end of the 25 years, by 15*s.* 2*d.*; so that if two persons possessed each his acre of this Wood Land, as soon as thus cut, and one of them cut all he further could from it, and abandoned it, placing out the money it produced at 4 per cent. Compound Interest, and the other retained and thus managed his Wood; at the end of 25 years, the advantage would be 15*s.* 2*d.* in favour of the monied man, and against the possessor of the Wood!!

Not a doubt can remain, I think, but the income is considerably less from Spring Woods, than from Arable and Pasture Lands of similar qualities to a great many Woods in this County; but on steep and precipitous Lands, or those so encumbered with self stones that cultivation could not be practised, it is otherwise: and this disproportion exists, even after the very great rises

 that

that Timber and Bark have experienced of late years, viz. Timber advanced in price as 11 to 7 in the last fifteen years, according to Mr. James Dowland (which is about equal to the increase in the price of Wheat, he says, excluding 1795 and 1796), and Bark as 15 (or more) to 8, according to Mr. John Gratton; and other articles, the produce of Spring Woods, growing small Trees, are in nearly similar degrees advanced: tho' the prices of Puncheons can hardly be expected to have advanced so much in proportion as Oak Timber and Bark, owing to the thinnings of the many modern *Plantations* of Firs, and other soft or white Woods, and the knotty tops of many still older Firs, which have come within a few years past, in increasing degrees, towards the supply of the Coal-Pits with Puncheons: and when it is considered, how immense the quantity is of *knotty and unserviceable Fir Trees* (owing to the almost total neglect of the judicious *pruning* and management, that should have fitted them as substitutes for Foreign Deal), that must ere long come only to such common purposes as Puncheons, or even that of Charcoal: I incline to think, that the present interest of the community, in want of Bread Corn (and Meat also), would be promoted, alike with that of the Proprietors, by clearing and cultivating the best soils now occupied by Spring Woods, in this County, and in the West Riding of Yorkshire also, notwithstanding the advice of the Reporter on that Riding (very able in his own line), who in p. 129 of his Report, calls for a Legislative Act, "requiring every Landed Proprietor to have a certain number of acres of his Estate in Wood Land*;" without considering, that numerous Proprietors

* Mr. William Pitt, in his Staffordshire Report, p. 179, with far more propriety,

Proprietors in that and every other district, are not possessed of a single acre of Land, in a situation, or of a quality, that should at this day be assigned to perpetual Wood, since we had on all hands better import Wood than Corn, while Meat cannot be imported, fresh at least, and that even whole Districts of the Kingdom are in this predicament, and where Timber Trees, well pruned and managed in the *Hedge-rows*, and in some acute angles of Fields (so as to detract the least possible from agricultural products), are all that can be allowed on the score of sound policy, in addition to the Groves and Plantations for shelter and ornament, which the Gentry will have about their Country-houses, wherever situate, and who too often as little consult true taste, as their own and their Country's interest, in thinking that great masses, and extent of acres, solely appropriated to the growth of Wood, are necessary in such situations. The only circumstance which occurs to me, that ought to defer the clearing of many of the best Spring Wood Soils in this County is, that a prospect should be held out, that Government, who are almost the exclusive consumers of very large Oak Timber, and are daily becoming so, as Cast-iron is introduced in Machinery, Bridges, &c., would hereafter allow such *increased Prices* for the same (of good quality) *, as should yield the same accumulated and accelerating increase of profit on the *latter years* of its growth, as Money experi-

propriety, exhorts the Legislature to enact public Rewards to those who plant Precipices, and Land *impracticable to the Plough*, and bring into arable cultivation an equal quantity of flat Wood Land: in which sentiments I heartily join him.

* The propriety and policy of which procedure is ably enforced by the late Mr. Thomas Davis, in his Answers to the Civil Commissioners of the Navy, that I shall have occasion further to notice in Sect. 4.

 ences,

ences, at the legal *Compound Interest* of the Country, in Annuities and otherwise, and as might be made, in despite of all Legislative Restrictions as to Compound Interest, on Monies received annually, or even that can be improved half-yearly, as in the case of cleared Wood Lands; in such case, I say, the Proprietors of the present Spring Woods, might be content to see the increasing heads of their Oak Trees, which must by no means now be restrained, except by the amputation of their dead or decaying lower branches, encroach upon, and at length almost exterminate their Underwood, and reduce these Woods to *Groves*, which I shall further consider in Section 4.

In Ashover, and other places, the Spring Woods are cut at 25 years growth of the Underwood, and the produce sold by the acre standing: a Professional Wood-Valuer being previously employed, to set out, measure, and value the Wood of the intended fall, which he does by numbering the Trees that are to remain standing, and making a ring of red paint round every waver or young spire which is to be left, of all which, as well as the measure of ground and value per acre of the remainder, he renders an account to the Proprietor of the Wood, or his Agent, who usually sell it in the Winter season, sometimes by Ticket, or private proposals, given in by the buyers, and at others by Public Auction: the buyers, who are principally Wood-Dealers, cut down and convert the Wood, and agree to clear it by the Lady-Day next but one following, and pay the Money in moieties, at the Midsummer and Christmas following the Sale.

I cannot here avoid mentioning, that great evils seem to result from this plan of resigning the Spring Woods, as it were, for more than a year, into the hands of per-

sons

sons who have no interest in preserving the ensuing crop of Underwood, and who, by carrying on their operations in a small and protracted way, thro' all the Summer, in making Hoops or other articles, and by remissness in the repair of the Walls or Fences, thrown down by the Trees in their fall, or by the constant climbing of their work-people, &c. &c., seem not merely to occasion the destruction in a great measure of the shoots of one entire year, but to do injuries of a more permanent nature to the Underwood. I am entirely averse to suffering Wood-cutters, or any of their produce or followers, to remain in Spring Woods much later than Midsummer, and that only for cutting and drawing out the *Oak* Timber, and Underwood, and Bark, and that the valuation and sale of Falls sold standing, ought to take place in time for the purchasers to begin cutting, converting, and carrying out the produce, except of Oak, early in the Winter, and when labourers might be had in sufficient numbers to dispatch the work: and I should strictly enjoin, that every wood-fence damaged, by the fall of the Oaks or otherwise, after the budding of the Wood in the Spring in particular, should be instantly and effectually repaired, and that no Horse or Ass should on any account be admitted into the Wood, especially after the budding time, without an effectual muzzle on, to prevent their cropping the tops of the young shoots, the mischief from which is incalculably great, and which no care but this can fully prevent.

In Glossop, the Timber and Wood is sold standing, as by that means the Auction Duty is avoided: but more commonly the sale is by *Ticket*, the process of which was described to me by Mr. Matthew Ellison, Agent to the Hon. Barnard Edward Howard: the buyers and the vendor being assembled at a public-house,

 the

the vendor puts a folded Ticket, containing his price of the Lot about to be sold, into a Glass on the Table; each of the buyers do the same, and then the vendor opens all the Tickets but his own, and declares the name of the highest bidder, but not the amount of his offer: a second delivery of Tickets by the buyers then takes place, and the name of the highest bidder among them is again declared; and then a third delivery, which, according to the practice about Glossop, decides the Sale; unless on opening the vendor's Ticket, none of the biddings come up to it, when the Sale is void, unless the highest bidder, or the next or following in succession, should agree to come up to the vendor's price in the Ticket, the amount of which is not however declared, unless a disposition manifests itself among the buyers, to further advances: it has rarely happened of late, that the biddings in this district have not exceeded the valuation and the seller's Ticket price, or that he is necessitated to accede to that of the highest bidder, who is considered as bound to take the lot in such case.

Shirley-Park Wood, of about 150 acres, principally of Oak, most of the Trees in which were stunted and ill grown, was entirely cut down about the year 1784, by Mr. William Cox of Culland, by which the health and thickness of the new crop was wonderfully improved; and lately Mr. William Pontey has, I believe, been consulted, on the best method of conducting the future thinning and pruning of this Wood, which appeared to me, when I saw it in 1809, to have been somewhat too long delayed.

It seems of considerable importance, and not always attended to, when the falls take place, and oftener perhaps in some situations, to carefully strip all the young

Ivy

*Ivy* Plants from the stems of Timber Trees, and the *Moss* also, which Boys or Girls, furnished with a piece of iron hoop or very blunt drawing knife, can perform at a small cost*. When Ivy has by neglect, or by the whim of a Proprietor, who may have thought it ornamental in his Woods, of which I have seen some striking and most injurious instances, been suffered to thickly envelope the whole stems of Trees, great care is necessary in removing this coat of Ivy, which, tho' probably sucking some of the best juices of the Tree from every pore where its fibrous roots insinuate themselves, has become necessary to preserve the Tree in its present sickly state, and if stripped entirely off at the time of felling the Underwood, the sudden exposure would materially injure, if not kill such Trees; the Ivy is best therefore cut and stripped off three or four years previous to the Fall, that the Underwood may protect the newly exposed Bark from the cold winds, or if this has been neglected, that the Ivy should only be chopped off, and its Roots all carefully torn out of the ground, and the stem carefully cleared of Moss and every other filth for about two feet high, leaving the Ivy to die on the Tree, that its leafless branches, when stripped off three or four years afterwards, may the less suddenly expose the Tree.

Too much attention cannot be shewn, to cut all the dead or dying small branches close off from the trunks of Trees, just below the main forking or branching, in which situation such branches are almost sure to die,

* In Mr. John Holt's Lancashire Report, p. 83, he says, that Lime dissolved in water, and made into a white-wash, and applied to the stems of Trees with a brush, will effectually destroy Moss: this may perhaps be worth trying in Woods, after the rough coat of Moss has been scraped off.

owing to the main arms above them, depriving them of the returning sap at least, if not of that which in ascending, is forced into currents on each side of such branches, in its way to higher parts of the head; and where this has been neglected, nothing is more common, than to see small rotten boughs pointing rather upwards, as if on purpose to conduct water from every shower of rain, into the very heart of Trees so neglected.

In some parts of this County, considerable pains seem to be taken in the use of the Falling Axe (of which the handle is 2½ feet long, the blade three inches broad, and of the extraordinary length of 15 inches, including the Eye, as about Whittington), to form the stools or stumps left in the ground in Spring Woods, rather round at top, to shoot off the wet and preserve the butt from decay, where young shoots or wavers are expected from them: pains and waste of Wood, that are, I conceive, very ill bestowed, from having long observed the growth of such shoots in all their stages up to Trees and fallen Timber, in Bedfordshire and other Counties, where a contrary practice, that of purposely *dishing* them, so that water may lodge in the centres of the butts, has long prevailed; and it is understood, that the sooner the young waver, or wavers especially, if more than one are left for Trees, attaches itself to and entirely depends on *one* of the healthy lateral roots (as observed of old White-thorn stumps, p. 86), by the entire decay of the core or centre, the better is the future prospect of such wavers, as to making good Trees, which in such case I am satisfied that they will generally do, and much quicker than Maiden or Seedling ones: and the idea of some, in such round top't falling, to preserve the *Tap-root*

(of

(of which so much has been said), seems altogether founded in mistake, since those distinguished Naturalists, Sir Joseph Banks, Bart. and Thomas Andrew Knight, Esq., in answer to the third of Lord Glenbervie's Queries, that will be given in Section 4, both expressly declare, from repeated observations, that neither the Oak or any other Tree continues, after the few very first years of its growth, *to preserve the Tap-root*, which has been so essential to its Seedling growth, but that such either perish, or soon become lateral roots, like all the others.

The *filling up* of the many vacant places that I noticed in the Underwoods of this County, at Brackenfield and other places, with *Ash* and others of the Woods found most productive and profitable in such Woods or their vicinity, seems too much neglected, at the periods of the Falls; and where it would pay well, even to imitate the excellent example of John Denison, Esq. (see Mr. Robert Lowe's Nottingham Report, p. 89) in grubbing up Hazels, Thorns, and other trash in his Nottinghamshire Woods, to plant these more valuable sorts in their stead: and where William Pegge Burnell, Esq. Sir R. Sutton, &c. also fill up with planted Ash (p. 87 and 88), which seems greatly preferable to the uncertain method of others (p. 78), in leaving key-bearing Ash Trees in the Spring Woods, to raise Seedling Plants, by their means; since such are always slow growing and unprofitable Trees, as will be explained in speaking of Pruning, towards the end of Sect. 4.

*Bark* will be spoken of in Section 4.

On the appropriation of different *sorts* of the Underwood to particular uses, I noted that *Hoops*, are not made in the County, but on a small scale for local consump-

consumption, except at Moor-hole, near Mosborough, I believe.

*Poles:* from the considerable distance of any Hop Plantations, little of the Underwood is disposed of in length, as Poles, except to the Hurdle-makers and Wood-turners, &c. but the greater part of these, the larger ones in particular, are cut into lengths in the Woods, and sold as *Puncheons*, as before observed, p. 226; in Wingerworth these, of five feet long, sell at 4*d*. each, or 6*s*. 8*d*. per score; and of four feet, being slighter also, at 2*d*. each, or 3*s*. 4*d*. per score. *Hedge-stakes* five feet long, here also fetch 1*s*. 2*d*. per score, four feet long 7*d*. per score, and *Hedge-bindings* 3*s*. per hundred.

*Broom* or Beesam-staves are here 1*s*. 2*d*. per hundred: at Whaley in Bolsover, these and *Rake-staves* were preparing in the Woods.

*Beesam*-twigs or Birch-cuttings, at Wingerworth, per bundle, six feet in girt, 1*s*. each.

*Sickle-handles* and other *Turnery wares*. In the Woods in Eckington and Mosborough, the smaller Birch and Alder Poles are cut up into Staves, 12 inches long, and 1½ to 2½ inches diameter, chopt into octagons, and sold on the spot at 8*s*. per pack of 20 dozen of Staves, each of which will make two Sickle hafts or handles at the *Turning-mills*, of which there are several in the County, worked by a Water-wheel, whose principal employment is for the Cotton and Flax mills, &c. in making their Bobbins and Spindles, viz. at Alport in Yolgrave, Bonsal, Cromford, Derby (by Steam Engine), Eckington, Lea, Repton, Tansley, Watstanwell-bridge, Wirksworth, &c.

*Hurdles*, or *Fleaks*.—Mr. William Booth, of Eckington Turning-Mill, manufactures Fleaks on a considerable

siderable scale, from underwood Poles and thinnings of Plantations: he saws down the Poles by circular Saws, instead of cleaving and chopping them, and bores the mortising holes by Centre-bits turned by the Mill: this practice might be advantageously adopted in other situations, and by which the Poles would be all carried out of the Spring Woods to be manufactured, as I have recommended.

*Turnip-fleaks*, with four bars and two yards long, of cleaved Oak, hooped at top, and pointed for driving, are sold about Lullington at 5*s*. or 5*s*. 6*d*. each.

I shall, perhaps, not have a more fit opportunity than this to mention, that at Mr. Samuel Tudor's at Coxbench, and Mr. Richard Harrison's at Ash, I saw a new sort of *Fleak Hurdles*, *made of Cast Iron*, four feet high, with five light yet strong ribbed bars, two yards long, with dove-tails at top and bottom of the heads, by which these Fleaks are effectually locked together, as they are set, and to iron Stancheons pointed for driving into the ground: these Fleaks were cast at Bridgenorth in Shropshire, by Messrs. Hezledine and Rastrick, and cost 9*s*. each delivered at Stourport (whence they came by the Canals): Fleaks of similar form but of less dimensions, for Sheep, 7*s*. each.

*Cord-wood*, of round Billets from refuse underwood and lop, 11*s*. per cord of 128 cubic feet stackt.

*Charcoal*, is made in considerable quantities in Sir Thomas Windsor Hunloke's Spring Woods in Wingerworth, the refuse Underwood from the Puncheons, &c. and lop of the Trees, being first cut and stackt in Cords, each eight feet long, four wide, and near five feet high (in order to allow for hollowness, four feet being considered the standard), and containing about 155 cubic

cubit feet as stackt, which will in general make 24 stricken bushels of Charcoal. Some buyers contend, that the Cord ought to measure $8\frac{2}{3} \times 4\frac{1}{3} \times 4\frac{1}{3} = 162\frac{3}{4}$ cubit feet, and to make about half a load, or dozen of Charcoal, of 72 stricken bushels, weighing about 6½ cwt. when dry. At Alderwasley also, much Charcoal is made; and on smaller scales in a great many of the Woods enumerated page 219.

I heard of no instances of the *Grubbing* up or Stubbing of ancient Woods, to cultivate their sites, tho' from what I have said in page 225, such a measure seems advisable on some of the best soils now occupied by Spring Woods; and the same arguments would apply, with greater force, to many Plantations made within the last half century, and their pruning neglected, on some very good soils: it is asserted here by many, that the want of value in the Roots and other Fire-wood, and the high price of labour, would occasion an expence of 20*l.* to 25*l.* per acre, to clear Wood Lands fit for cultivation; but surely a gang of Sussex or Kent Grubbers and Charcoal-burners, would teach them better.

## SECT. II.—WOODS, WITHOUT UNDERWOOD.

*Beech* Woods, without Underwood or admixture of other Trees, such as abound in Hertfordshire and other Chalky Counties, are here unknown, and owing to the comparatively recent introduction of other Plantations besides those of Oaks, now become Groves in Parks, &c. for the most part, which will be noticed in Sect. 4, it cannot be stated that any system of management

ment as to Cutting, Application, Rent, &c. has yet been established, but on which I shall have occasion to say something in the next Section.

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## SECT. III.—PLANTATIONS.

A VERY laudable spirit has pervaded the Land-owners in this County, for improving and ornamenting their Estates by Plantations, made within the last 50 or 60 years, but principally so in the latter half of that period; and in general, steep, rocky, and barren Lands, have been selected for this purpose, which could scarcely be otherwise improved: but instances are not wanting here, as in most other Counties, of too great a breadth of even and useful soils for Husbandry, having been appropriated to the growth of Wood, and most of which, the rapidly increasing Population of the Country calls alike loudly with the private interests of their owners, for their being cleared again, as soon as circumstances will admit.

The modern *Plantations*, are principally of mixtures of Scotch, Larch, Silver, Spruce, &c. Firs, Oak, Ash, Elm, Sycamore, Birch, &c. at the following places, viz.

Abney
Alderwasley
Allestry
Alsop, S W
Ashover
Aston on Trent
Bamford
Bank-hall
Bakewell
Belper
Blackwall in Kirk Ireton
Bradley
Brailsford
Bretby
Buxton
Calke

Catton

Catton
Chatsworth
Chunall
Church Gresley
Coxbench
Cross-o'-th'-Hands
Cromford
Darley-flash
Dinting
Doveridge
Edensor
Foremarke
Foston
Glapwell
Glossop
Great Hucklow
Great Rowsley, N
Hargate Wall
Hartshorn
Hassop
Holloways
Hopton
Kedleston
Lea
Leam
Little Hayfield
Locko-Park
Longford
Markeaton
Matlock Bank
Matlock Bath
Measham
Mellor
Milford
Newton Solney
Norton
Osmaston, near Shirley
Radburne
Renishaw
Shipley
Shirley
Stanesby
Stanton in the Peak
Stoke
Stubbing
Tibshelf (Hurst)
Walton (Lodge) in Chesterfield
Willesley
Willersley
Wingerworth
Wormhill
Wyaston, &c.

The very thriving Plantations made by Samuel Oldknow, Esq. in Mellor, from 1790 to 1800, consist of a judicious mixture for ornament, of the following twelve sorts of Trees, viz. Abele, Beech, Elm (English and Wych), Larch, Mountain-Ash, Oak, Poplar (balsam and black Italian), Scotch-Fir, Spanish-Chesnut, and Sycamore, with some few others occasionally. This Gentleman has numbered, and keeps an account of a large number of the individual young Trees in these Planta-

Plantations, to mark distinctly the effects of pruning, thinning, &c. upon their growth and progress.

Mr. George Henry Strutt, very laudably applies himself to the superintending of the planting of about 100,000 Larch, Scotch, and other Trees on his Father's Estate (George Benson Strutt, Esq.) in Belper, and to the pruning and management of the extensive Plantations previously made there, and keeps accurate and systematic accounts, of the expence and time of planting, of pruning, and of thinning, of the value of the produce cut, and of the measure and value of those Trees standing in the several Plantations made by his Father.

Mr. William Milnes, jun. is also beginning to take charge of his Father's Plantations and Timber in Ashover; a practice, in the Heirs to Estates, that I cannot sufficiently commend, or hold it up as I wish, to the imitation of other Young Men, as calculated in an eminent degree to benefit themselves and their families, as well as their Country; since it is only by the long and unremitted attention of individuals to this essential branch of Rural Economy, assisted by method and recorded facts well ascertained—instead of trusting to memory, vague estimations, and the opinions of others—that we can hope to see that reformation or improvement therein, which cannot but strike the eye of the attentive observer, in every District of the Kingdom, to be necessary. Upon the recorded facts of the progress, and state, and value of Plantations, as above, I would strongly recommend, that frequent and periodical *calculations* should be founded, and recorded, allowing Compound Interest at Five per Cent. to accumulate on the net value (after deducting expences) of all thinnings or casual profits, between the periods of exact measurements and valuations of the growing Crops,

Crops, adding this to the value of such Crop, and deducting the first cost of Planting, or the value of the growing Crop at the last period of valuation, with Compound Interest thereon; and then inquiring, what Annuity or yearly Rent forborne during this period (allowing Compound Interest as before), would amount to the sum which remains as above: and by the side of this, the present average Rent in the District, of Lands of similar qualities that are Let, should be recorded in each instance. Within the probable duration of the lives of the young Gentlemen, in particular, to whom I am alluding, most important documents would be thus acquired, that are now almost entirely *desiderata*, in this important branch of Rural Concerns; to show, to what age Plantations continue really to *increase in value*, and at what rates, compared with the Rents of similar Lands, &c. &c.

I have to lament for myself, that the multiplicity and magnitude of more pressing concerns, while I was entrusted with the management of the late and justly lamented Duke of Bedford's Property in Bedfordshire, prevented more than one measurement and valuation of a Plantation (of eleven acres), such as I am now recommending, and confined my exertions, to keeping minutely divided Accounts of the Expences and Receipts (with quantities and values for all such, carefully ascertained), for every separate Wood and Plantation, and the several Falls therein, numerous as they were, as *data* to be applied to measurements of standing Crops in them, to be taken under more favourable circumstances. Perhaps I may be excused for mentioning here, that a very full detail of all these particulars, presented to the Society of Arts, relative to the measurement of *Brown's-Wood Plantation*, above alluded

to,

to, met their approbation, and is preserved in their Twenty-third Volume of Transactions, p. 112.

From having attentively noticed the growth of mixed and separate Plantations in various soils and situations, I am decidedly of opinion, that it is not good policy to mix Trees, except only those sorts that are ultimately intended to form Timber and Underwood; and think, that the suggestion of Mr. James Dowland, in the valuable unpublished mass of information, to which I shall more particularly refer in the next Section, of mixing clumps or patches of different sorts of Trees, in ornamental Plantations, of any considerable size, instead of mixing individual Trees, is calculated to secure and even improve every object of beauty and ornament, in such Plantations.

The Hon. Barnard Howard plants 50,000 or 60,000 Larch, Scotch, and Beech annually, in Glossop Parish: the Scotch intended as nurses, and to be cut away in the Thinnings.

*Nurseries*, for raising young Plants*, are attached to the Garden Establishments of the principal Planters, as at Belper George B. Strutt's, Bradby Park the Earl of Chesterfield's, Chatsworth SW the Duke of Devonshire's, Haddon Hall W the Duke of Rutland's, Kedleston (at Ireton) Lord Scarsdale's, Leam Marmaduke M. Middleton's, Milford Messrs. Strutts', Stoke Hall the Hon. John Simpson, &c.; which seemed very well managed, and so in general were the Nurseries for Sale which I noticed, at Chapel-en-le-Frith, Duffield Bank,

* The term Nursery is also applied to Plantations, in many parts of the County.

Matlock, Measham, St. Peter's in Derby, Slack in Ashover, &c.

In preparing for *Planting* on the heathy Grit-stone Lands, I beg to call the attention of the Planter to p. 306 of the 1st Volume, and to p. 362 of Mr. Holland's Cheshire Report, to see the necessity of sinking his holes quite thro' the roots of the Heath Plants, into the natural soil below, which experience has shewn, to be in the general, much the fittest for the roots of the Plants to strike in.

In very exposed situations it has been recommended, in Mr. Lowe's Nottinghamshire Report, to shorten the ends of the lateral branches of the Plants, at the time of planting them out: something of which, I think, I saw practised at Hopton: it has been also recommended, in such situations, to make the Plants *lean* towards the prevailing wind of the spot, at the time of planting, Notts. Rep. p. 64: but it will not be right in the Planter to trust to any of these expedients, but frequently for some months after planting, especially when the Plants are not very male, to go over and fasten the Plants loosened by the Wind, which appears by much the most common cause of the failure of young Plantations. The precaution, of dipping the Roots of Plants into a mixture of pretty good Mould and Water, mixed in a hole in the Ground or in a Tub, to the consistence of thin Batter, called Puddling them, ought seldom to be omitted, just previous to setting them, in the Spring.

The difficulty of raising Plants, on high and exposed Hills, have suggested to some the expedient, of planting first round the base of the Hill, and proceeding, in two or three years, with a horizontal strip above this, and after a few years with another strip, and so on until

until the whole Hill be covered: the force of the Winds on the youngest Plants being weakened by passing thro' or over the previous planting.

Sir Joseph Banks, Bart. in planting a large tract of heathy poor Land, on the 2d Grit Rock N W of Ashover, in 1807 and 1808, employed Mr. Joseph Withers, Nursery-man and Planter, of Newark in Nottinghamshire, first to plant strips or skreens of Scotch Firs, about 40 feet broad, and at about the distance of 100 yards from each other, extending the whole length of the piece, which exceeds 13 furlongs, and these being crossed at larger intervals by other similar strips, at right angles: intending, when these thickly planted skreens of Scotch Firs have acquired some height, so as to shelter the inclosed Fields or Patches, to plant them with Larches, no thicker than they are intended ultimately to remain: if perfect care and attention is paid to the selection of the best Plants, and to renewing all those that don't perfectly succeed in the first stages of their growth, and with persevering attention to *pruning* these Larches for several years after, they doubtless may thus be raised to tall and profitable Timber, even in this high and exposed situation: but when I consider the great risk, of inadequate attention being paid to these essential particulars, under the eye of less able and vigilant Proprietors, I cannot recommend this mode of *thin* planting, however sheltered the situation may be, to general adoption, being convinced, that moderately *thick planting*, as well as unremitting attention to *pruning* and *thinning*, are essential to raising the most profitable Plantations, as I shall endeavour more fully to show further on. To all Planters, I would recommend a careful perusal of the directions given in Mr. William Pontey's "Profitable Planter"

ter" and his "Forest Pruner," and in Mr. Francis Blaikie's "Farmer's Instructor, for the Planting and Management of Forest Trees." In the latter work, p. 21, the preservation of young Plants from the Barking of Hares and Rabbits, is said to be cheaply effected by smearing their Stems over with a mixture of Cow-dung and a little Lime. In the part of Sudbury Park, where Rabbits abound, it was pointed out to me, that all the young planted Oaks had been barkt and destroyed by them, while the Sycamores were not at all touched, and the Larch but little, by these small depredators.

I was sorry to learn, when viewing the Duke of Norfolk's Plantations, with Mr. James Dowland, on the edge of Nottinghamshire, that *Squirrels*, which it is so very pleasant to see in such situations, and of whose Kells, Drays, or Nests, I saw many, near the slender tops of high Trees there, are found very injurious to Larch, and some other Trees: the knowledge of this circumstance, could hardly have given rise to what appeared to me to be a barbarous, tho' ancient custom in Stanton in the Peak, of making a general Hunt on Christmas Day, after these pretty little animals, to kill them.

*Sorts of Trees.*—In running through my travelling Notes under this head, I shall notice the several sorts of Forest Trees and common arborous Plants in alphabetical order, and mention some particulars of the cultivation or growth of each, in particular places, the prices per foot, instances of old, large, or remarkable Trees, &c. &c.

1. Abele, or White Poplar (*populus alba*) planted at Mellor, &c.

2. Alder (*betula alnus*) has been already mentioned

as

as a Hedge-wood, in p. 91. I noticed these Trees growing very fine at Drakelow, Ingleby (very high), Measham-field, Milton, Repton, Wingerworth, &c. About Wingerworth, this Wood sells from 1s. 6d. to 2s. 3d. per foot; at Belper, Messrs. Strutts give 12d. to 16d. per foot, for Alder Poles, up to four inches diameter, for turning Bobbins, Spindles, &c.: its use in turning Tool-handles in Eckington, &c. has been mentioned already, page 234. At Edale and Kinder, &c. I saw the Poles of this Wood peeling for the use of the Manchester Dyers, as mentioned in Mr. Holland's Cheshire Report, p. 206, who states it to fetch 6l. or 6l. 10s. per ton, delivered at the Dye-houses.

3. Ash (*fraxinus excelsior*); has been already mentioned as a Hedge-wood, in p. 91, and as the best species of Underwood, in p. 233: the Mineral or Peak Limestone District is more famous for the growth of this than any other Tree, and several names of places there seem to have been derived from its prevalence: I noticed this Tree, or young Plantations of them, as follows, viz. in Alderwasley (fine Trees), at Ash in Sutton (large), Ashford, Ashgate (Plantation made about 1788), Ashover, Astwood, Bakewell, (Plantation 1*m.* S.), Barlborough Park (large), Barrow (Plantation), Beard (in Hedges), Beighton, S W (fine), Bradby-Park (very tall, planted 1735), Catton (Plantations), Chatsworth (fine), Donisthorp, Eyam, Great Rowsley, Hassop, Little Longsdon, Locko-Park, Longford Park (fine), Matlock, Measham-field (Plantations), Oakerthorpe (large), Openwood-Gate N E (Plantations), Oxcroft (large) Peak Forest, Stanesby, Stanton in the Peak (pruned), Stretton in the Fields (Plantations), Sutton in Scarsdale, Ticknall (at Knoll-hill), Wingerworth, &c. About half a mile W of Ashford, I saw a few

 success-

successful attempts to raise Ash Trees on the barren Slither or sliding Gravel, mentioned Vol. I. p. 145: the long roots of the Ash seem better adapted than any other Tree, perhaps, to reach the soil beneath this Slither, if once the Plants can be got to grow. In examining the black Marble Quarries, or rather Mines, at the W end of Ashford, I was somewhat surprised to see a green Ash Stick, that had been carried underground some weeks before, as a measure, having shot out white Sprigs and Leaves, two or three inches long, from several of its buds. About Wingerworth good Spring-wood Ash Timber, sells from 2*s*. 6*d*. to 3*s*. 3*d*. per foot, Hedge-row Ash from 1*s*. 6*d*. to 2*s*. 6*d*.: at Belper good Ash was bought at 20*d*. per foot, in 1809.

4. Aspen or Asp (*populus tremula*) were noticed in Bradby Park, Markeaton Park, South Normanton, &c. The valuable property possessed by this Wood, of not casting or warping, and its great durability also, according to Mr. Thomas A. Knight, seem to require that it should be more known and cultivated.

5. Balm of Gilead Fir (*pinus balsamica*), this I saw growing at Catton and at Ingleby.

6. Beech (*fagus sylvatica*). My Notes as to the growth of this Tree were made at Bradby Park (fine 1735, pruned), Chatsworth Park (and S W fine), Foremarke, Glossop, Heath, Hopton, Kedleston Park, (Avenues, &c.) Little Eaton, Mellor, Overton, Stoke, Ticknall (at Knoll-hill, fine, one very large), Willersley, Wingerworth, Wormhill, (Plantations and Hedge-rows), &c. About Wingerworth the price of Beech Timber is 2*s*. 6*d*. to 3*s*. 6*d*. per foot. Those who plant this Tree, with a view to it as Underwood (as has been recommended) will be disappointed, unless

less the Plants are cut down when young, as stools of Beech Trees of any size, rarely if ever shoot again.

7. Birch *(betula alba)*, is very common in the Hedges in some districts, as mentioned p. 91, and abounds also in the Underwoods in some parts; it has been a good deal planted, throughout the County, as nurses for more valuable, or Timber Trees, in the early periods of their growth. Perhaps the oldest Trees of this sort in the County may be those at Overton, appropriated to the Making of Wine, as mentioned p. 216; its Wood seems in demand by the Turners, page 234.

8. Black-thorn or Sloe Tree *(prunus spinosa)* is a worthless Bush, noticed only in a very few Hedges in this County, see p. 89, where it is apt to spread fast into the fields, by means of its roots and succors.

9. Cedar *(pinus cedrus)*, seems to be scarce in the County; near the east front of Bradby Hall, there is a large and remarkable one, supposed to have been planted about the year 1682, its trunk for 17 feet high measures 13 feet 2 inches circumference, on which rises three prodigious upright branches, nearly of equal sizes.

The well known property of this Wood, to drive away or destroy insects, probably arises from its Resin or Turpentine being slowly volatile, at the ordinary temperatures, as William Strutt, Esq. of Derby, rather disagreeably experienced a few years ago, on having new Cases and Drawers of this wood made for his Mineral Collection, and on examining of which, after an absence of some months, particular Fossils in the Drawers were found so completely coated with soft and sticky Resin, that it had run off them and in part filled the small paper trays, in which such Fossils lay, and what seems extraordinary, other Fossils

appeared to have attracted none of this volatile Resin, nor was the Papers or the surface of the Wood of which the Drawers were made, sensibly soiled by it.

This property of Cedar Wood, is noticed in the Philosophical Transactions, No. 110, an exactly similar thing having happened to Dr. Lister in 1674; and I have lately experienced the same disagreeable effect, tho' in a smaller degree, from a number of new black-lead pencils that were kept together in a tin case, which they lined with their sticky Resin.

10. Cherry, Wild, or Mazzard *(prunus avium)*. This Tree I noticed at Bretby, Foremarke, Glapwell, Pinxton, &c. In Bradby Park, in the first of these places, Earl Chesterfield has many of these Trees, 15 inches diameter at the bottom, and 40 feet high without a branch: and their Wood has proved so useful and durable, and even the cleaved Poles of it in large Park Fences, of 30 years standing, that it is now planted there on a large scale, and grows most luxuriantly, and from the facility with which it can be moved, when of considerable size, out of the Woods where it sows itself, or from Plantations where it has performed the office of a nurse, it is preferred to any other Tree, by Mr. Francis Blaikie his Lordship's Agent (see his "Farmer's Instructor," &c. p. 16), as a nurse to young Oaks and Spanish Chesnuts, being in this case cut down, the first year after transplanting, when large.

11. Crab *(pyrus malus)*, has been noticed as a Hedge Plant, in p. 89; in Ashover and a few other places, I saw single Trees of this kind, but its Timber seems not an object of culture. It is excellent for the heads of Mauls, and Beetles, Mallets, &c.

12. Dishley, or Huntingdon Willow *(salix alba)*,

a va-

a variety of this useful Wood, which the late Mr. Robert Bakewell the Breeder, introduced on his Dishley Farm in Leicestershire, whence it has within a few years past spread to most Counties in England, is cultivated in small patches or strips by the fences, mostly in low situations, by many Farmers in this County, for furnishing them with Poles for Fleaks and other purposes, for which its quick growth, straightness, lightness, and durability, so well fits it: I saw it in Ash, Drakelow, King's Newton, Measham, (by the Roads' sides), Melborne, Sawley, Stanton by Dale, Swarkestone Lows, Waldley, &c. On the dry land at Swarkestone Lows, they are cut at five to seven years growth. I saw no Trees reared or training of this sort, tho' their increase as such is highly spoken of by Mr. Holland, in the Cheshire Report, p. 205.

13. Elder *(sambucus nigra, & alba)* have been mentioned as mischievous Hedge Plants, in p. 90; I saw no instances of training them up for Trees, tho' the wood is so useful for many nice purposes; when straight and clear, answering as a substitute for Box.

14. Elm, English or narrow leaved *(ulmus campestris)* I noticed as follows, viz. at Ash (large), Aston by Trent (fine young), Astwith (fine), Bradby Park (fine, 1735, pruned, Avenues), Burrow-hill, Coton, Croxall (Avenues), Dalbury Lees (large), Doveridge (fine young), Drakelow (fine young), Elmton, S (young), Etwall Hall (Avenues, and S E young, pruned), Foremarke Hall (fine), Haddon Hall (old), Hassop, Little Longsdon (spreading), Matlock, Mellor (young, pruned), Nether Thurvaston (large), Over Haddon (old), Radburne (large), Snitterton, Ticknall (old and Avenues at Knoll-hill), Wingerworth, Wirksworth, S (fine, on Shale), &c. About Winger-

Wingerworth this Timber sells at 2*s*. to 3*s*. per foot: at Walton on Trent, Wood 3*s*.

15. Elm Wych, or broad-leaved *(ulmus montana)* seems less known in the County than it ought to be, according to some who have tried it, and find it little if at all inferior to Ash, for Wheelers' and Husbandry uses: its Seeds may be sown in the same season that they ripen, and it is a very quick tho' scraggling grower, and therefore the more in want of pruning, both to train it up to a single clear stem, and to prevent its injuring other Trees near it. I noticed this species of Elm in Matlock, Mellor, Overton, St. Peter Derby, &c.

16. Hawthorn or White-thorn (*cratægus monogynia*) has been mentioned as the prevailing, and almost only plant cultivated in modern hedges, p. 88; except in Bonsal, and some other places on the Limestone, and in some few Parks, the Hawthorn is seldom suffered to stand as a Tree, and no where have I seen it trained up, as it might be, to a clear bole, the Wood of which would be hard, and beautiful in the grain: at Hall-end in Ashford, I saw it used in veneering Furniture, with very good effect.

17. Hazel or Nut-Tree (*corylus avellana*), as a too common Hedge-wood, has been mentioned p. 91, and as an unprofitable Underwood, in p. 233, on account of its slow growth, and the temptation it affords to idle and mischievous persons to trespass on the Fields and Woods, and break down their stems: and owing to its having no particular Application or Use in this County, as it has to the Crates of the Potter and Glass-maker in Staffordshire, to the Coal Corves in Durham (which here are made of Boards, see p. 346, Vol. I.), to small Cask Hoops, wattled Hurdles, &c. in other places.

18. Hem-

18. Hemlock Spruce (*pinus balsamea*); this variety of the Fir tribe, I saw only in Chatsworth Park.

19. Holly, Hollin, or Holm (*ilex aquifolium*), which has been mentioned and recommended as a Hedge-wood, p. 89, is very rarely trained and raised as a Tree, tho' from the excellency and value of its Wood, when straight and clear, and of its Bark in making Birdlime, this Wood certainly would answer, to a certain extent, when so treated: the manner in which the Stools of Holly were destroyed in Rowlee, p. 89, strongly illustrates the mode in which the various other species of Trees, that once clothed great part of the barren, naked Moor-Lands of the Northern parts of this County (Vol. I. p. 382), were exterminated, by the continual bitings of starving Animals, as soon as their Stools began to shoot, after felling: and thus the fine Ash disappeared, and had no successors, on Bunster's naked and steril sides, as noticed by Mr. W. Pitt, in his Staffordshire Report, p. 197.

20. Hornbeam (*carpinus betulus*), tho' little known in this District, seems very well adapted to it, and a number of them well trained *as Trees*, would hereafter find a ready sale, for making the Cogs to fix into Cast-iron Wheels to run in iron pinions, which in large Machinery is found so very preferable to working iron against iron.

21. Horse Chesnut (*æsculus hippocastanum*) is a Tree not much known in the County; tho' from the very fine ones growing in Bradby Park, there can be no doubt of its succeeding well in many parts of it: the Timber of these Trees is very white, and valuable for the Turners, and would pay well for planting and proper training.

22. Larch (*pinus larix*). The many good properties of

of this excellent Tree is beginning to be pretty well understood in this County, and it has perhaps been more extensively planted of late than any other Tree; and to which I am inclined to think, that the strong recommendation of it given by Mr. William Pontey, in his "Profitable Planter" and "Forest Pruner," has a good deal contributed: I noted these Trees in Ashover, Bakewell E S E, Belper, Chatsworth (fine), Chisworth W, Cromford, Darley Flash (large Plantations), Doveridge, Edensor, Foremarke Hall, Glossop Hall (tall and large, and Plantations N E), Great Hucklow, Haddon Park, Hopton (large, and Plantations), Ingleby (fine, 40 years growth), Kedleston (large, near Ireton House), Leam, Matlock, Mellor, Overton (large), Shipley, N W (fine), Stanton in the Peak (fine), Stoke Hall, Sutton in Scarsdale, Upper Padley (large), Wingerworth, &c.

Major A. A. Shuttleworth of Hathersage, has the Doors, Sashes, Tables, Chairs, and other furniture of a Room, made of Larch-wood, of 59 years growth, cut in Upper Padley Wood, which measured 73 feet per Tree: and which Trees were planted by a Man still living: a better recommendation of this valuable Tree, need scarcely be desired.

A Larch of 54 years growth, near Hopton Hall, measured in 1809, 83½ feet of Timber.

Desirous of recording the age and progress of a fine Larch (the largest in Ashover), which can easily be found hereafter, from standing near the N E corner of Sir Joseph Banks's Summer-house in the Plantation, on the first Limestone Hill S E of Overton Hall, and was planted in the year 1755, as Mr. —— Gregory of Overton remembers, I measured its circumference at four feet above the ground, on the 8th of April 1808, and found

found it 5 ft. 6½ in.; and repeating the same again on the 21st of September 1811, its circumference then at the same height was 5 ft. 11 in.

In Glossop, Larch Trees squaring 8 to 12 inches, measured with the Bark on, and without allowance, sold in 1809 for 2*s*. 6*d*. to 2*s*. 9*d*. per foot. In Wingerworth, Larch Poles of 8 or 10 solid feet measure, sell from 2*s*. to 2*s*. 6*d*. per foot.

23. Laurel (*prunus laurocerasus*): I saw but few of these Plants in the County, tho' they might, I think, be introduced, as Underwood, with Holleys, Laureltines, &c. in Evergreen Woods, near Gentlemen's Seats, with excellent effect, as in the large Plantations called the *Evergreens* at Woburn in Bedfordshire, which are so much admired by all who see them in the Winter Season.

24. Lime (*tilia europœa*) I noticed in Bradby Park (fine and large), Elmton (Avenues), Plesley, West Hallam (large, near the Church), &c. Earl Chesterfield's Library is fitted up with Lime-wood, cut out of his Park a few years ago, and is a very handsome specimen of the use of native products, which cannot be too much encouraged.

25. Maple (*acer campestre*), has already been mentioned as a Hedge-plant, p. 91. Some good sized Trees of it occur in Bradby, and in Catton Parks, &c.; and it might answer to apply more care to the training and raising of this Tree, on account of the excellent quality of its Wood.

26. Mountain Ash (*sorbus aucuparia*) are dispersed thro' the County, tho' in no great numbers; I noticed some large ones in Cromford: at Mellor they are planted.

27. Norway Oak: several of this species of Oak are

growing

growing very fast near the entrance to Bradby Park from the Ashby and Burton Road.

28. Oak (*quercus robur*); this King of the Forest, seems particularly fond of some of the Soils in this County, where Ironstone is dug, as mentioned p. 395 of Vol. I., and throughout most of its argillaceous Tracts its Timber is noted for being very sound and good: the only exception to its clayey Soils suiting Oaks, is mentioned Vol. I. p. 303, and which some would perhaps refer to partial or mistaken observations, after examining the Oaks in Wey Wood on the S E of Wormhill: all the moister parts of its sandy and other Soils, seem also sufficiently adapted to the growth of this important Tree; the very steep and uneven parts, and those covered by loose blocks of Stone, will in general be found adapted to Oak, whose Roots will generally find ample nourishment under the shelves of Rock, or in the Strata of steep Banks, or under large loose Blocks, which protect them from the Sun and droughts; and as to *Soil* below, for the deep descent of the *Tap-root*, that may as safely be laid out of consideration, by the Planter of Oaks, as of any other Tree, as observed p. 232. As the Oak grows much longer than most other Trees, the recording of my observations as to its localities in this County (besides in Spring Woods, p. 219), rather more particularly than for other Trees, may have its use, when myself and the present age shall have passed away; I shall therefore give separate Lists of—1. Young Plantations, wholly or in a great part of Oak;—2. Groves and Avenues of Oaks, without Underwood;—3. Large and fine Oak Trees;—4. Ancient Oak Trees;—and 5. Of Places where the Hedge-rows produce good or thriving Oak Trees.

1. Oaks

## 1. Oaks in *Young Plantations*.

Ashgate, planted in 1788, very fine
Bretby
Burrow Hill, S W
Catton, too thick
Chatsworth (New Plantation, &c.)
Doveridge, too thick
Edensor, fine
Hollingwood Common, pruned
Kinder in Glossop
Markeaton, pruned in 1792
Mellor, pruned
Pilsbury
Pilsley in Edensor, pruned in 1808
Stanage, pruned in 1809
Staveley
Stoke, pruned
Sturston, too thick
Sudbury, much too thick
Walton on Trent, too thick
West Handley
Wingerworth
Woodthorp in North Winfield, &c.

The late David Barnes, Esq. of Brampton, planted the Angle between the two Roads in Ashgate as above.

Eusebius Horton, Esq. of Catton, in the year 1782, sowed a Field of Wheat of 30 acres, on good Red Marl, with Acorns (except a few patches with Ash Keys), and with Gorse-seed, which, and the vast Crop of Weeds that sprung up, so choaked the Oak and Ash for the first eight or ten years, that the piece was repeatedly assigned to be ploughed up again: at length, however, the Trees prevailed, and grew most kindly and rapidly, and had Mr. H. had firmness enough to persist in the *Pruning* of these Trees, which he began about 1799, against which practice so unjust a clamour had then for a long time prevailed, and with proper thinning, of the Oaks in particular, they would now have presented a pattern for this part of the Country: when I saw them in 1809, they were suffering most lamentably for want of management. Mr. James Mander of Bakewell, informed me, that some attempts to raise Oak Plantations, by sowing Acorns on the Grit-stone

stone Soils near there, had entirely failed: perhaps owing to the Soil being less adapted to Oak than in the above case.

On the S W of Pilsbury, some young Oaks sown on the Limestone Shale in 1783, were far inferior in growth, in 1808, to the thinnings from them which had been transplanted when young, on to a higher part of the same stratum.

The Oak Belts on the S E side of Lord Vernon's Park at Sudbury, were sown about 1764, and for want of pruning and thinning, were smothering each other dreadfully when I saw them in 1809. Young Oaks, lately planted in what is called Oak-Rough, in the Park, had been repeatedly destroyed by Rabbits, without a remedy having been applied.

2. Oaks in *Groves* and *Avenues*, in general very thriving and fine.

Alfreton Park
Barlborough, fine
Bradby Park, very fine, 1735
Calke Park
Chatsworth Park, fine
Chilcote
Croxall, Avenues
Drakelow, Avenues
Foremarke and Ingleby, Avenues
Haddon Park
Hardwick Park
Hopwell
Kedleston Park
Longford Park
Oaks in Norton
Radburne Park
Shipley
Stanesley, Groves and Avenues
Stubbing, Pond-head
Sutton in Scarsdale
Willesley, Avenues
Wingerworth Park, &c.

In 1736, the late Sir Windsor Hunloke, Bart. planted the steep made Bank, or Head of the great Pond in Stubbing, with Oaks, about 120 of which are now remaining, as an open Grove, and the same were valued in 1810 at 500*l*.

3. Large

3. Large valuable Oak Trees.

Alderwasley, E, fine
Ash in Sutton
Calke Park
Chatsworth Park, fine, 1747.
Hardwick Park
Kedleston Park, very large
Sudbury Park, &c.

4. Ancient Oaks, much past their prime.

Chatsworth Park, S
Foremarke Hall
Hardwick Park
Little Eaton, E, an ancient Park or Wood
Sudbury Park
Thurlstone, 2 in the Town
Upper Thurvastone, at Mr. Cha. Bakewell's Farm, &c.

Mr. Robert Lowe has given some account of the famous Green-dale Oak in Welbeck Park, near the edge of this County in Nottinghamshire, p. 68 of his Report, but has omitted to notice two, scarcely less surprising Oaks, called the Porters, on each side of the North Gateway of this Park, on Sandy Gravel, the westernmost of which measures 1100 feet of Timber! as Mr. James Dowland informed me.

5. *Hedge-row* Oaks, and small Clumps in Field Corners, &c.

Alfreton, E
Barlborough
Beard
Beighton, Waterthorp Farm
Elmton, Frithwood Farm
Palterton
Peak Forest, by the Walls
Repton, Park Farm
Scarcliff, &c.

The Hedge-row Oaks in Palterton and Scarcliff, belonging to Earl Bathurst, have been mentioned p. 73, and it has been observed of *fertile Districts* (p. 227), that Hedge-row Trees, sparingly introduced, and well

trained up, are nearly all that such parts of the Country ought to contribute to the national stock of Timber.

The Earl of Chesterfield, in his Leases of Lands in this County, has the following Clause, touching the Tenants' planting in the Hedge-rows and corners of Fields, viz.

"And also shall and will, yearly, during the first five years of the said term hereby demised, at his or their own proper costs and charges, in such places as shall be pointed out by the Steward of the said Earl, his Heirs or Assigns. And if not so pointed out, then upon the Banks and Hedge-rows of the said demised Premises (          ) Sets of good young Oak, Beech, Ash, Elm, or Sweet-Chestnut, whichever is most suitable to the soil thereof, and shall and will, not only protect the same when planted, but constantly plant fresh Sets, as often as any shall die or be destroyed. To the end, that there may be raised upon the said demised premises during the said term,      number of Trees. The limited number inserted in the above blanks, is in general, five Trees annually to every 10*l.* of yearly rent: and for instructing the Tenants fully in the principles and manner of Hedge-row and Farm-clump planting and management, a Pamphlet (drawn up by Mr. Francis Blaikie, his Lordship's very intelligent Agent) has been printed at his Lordship's expence, and one delivered to each Tenant: and from the very able and useful manner in which this has been executed, I cannot but wish much, that his Lordship would order Mr. Blaikie's "Farmer's Instructor, for the planting and management of Forest Trees," to be reprinted and advertised for sale, that Landlords and their Tenants in other Districts, may avail themselves of it: and if the Tenants were to have a certain sum, say six-

pence

pence per Tree, for every *thriving Tree they had planted*, when it reached 10 years of age, one shilling at 20 years, and so on, this would give them an interest in the prosperity and preservation of the Plantations.

Altho' no one can be further than myself, from acquiescing in the opinions of Mr. Richard Parkinson, in the Rutland Report, p. 107 and 108, that Hedge-rows full of Trees, 'improve the Farmer's Crops, founded on his extraordinary and erroneous ideas, on the baneful influence of *Sunshine* on the Soil, and the fertilizing effects of mere *Shade!* which unfortunately run thro' all his otherwise useful writings; I have always observed that Hedge-row Trees, in proper numbers, are ever *prejudicial to the Farmer*, just in proportion to *their worthlessness*, and that where such are trained up by judicious *pruning* (which can alone do it) to the clear, tall, and straight bodies, most profitable to the Landlord and the Country, their effects are imperceptible on the Hedge; to the Grass or Crops they do little injury by their shade, owing to the small time that it remains on any one spot; and as to beauty, there can be no comparison, whether we regard the appearance of the Trees themselves, or their not impeding the *near* prospect around us, while to the *distant one* they give all the effect of a richly Wooded Country, in a superior degree; and to such Trees, in reasonable numbers, no one could be found to object, even in the Hedge-rows by the Roads' sides, when raised. To carry this, however, into effect, it is evident that a very different system must be begun and steadily acted upon, in the care and management of Estates, to that neglect which has almost usually been shown to the Timber and Wood on Farms, except at

s 2 periods,

periods when Money was wanted to be raised, from the cutting down of that which had grown up just as it could, or as the Tenant (ignorant perhaps of every true or liberal principle on the subject) had chose to suffer it; and who in many Districts, have left the Landlord nothing that would pay his expences, if he properly repaired and reinstated the Fences after cutting down his Trees, (Timber, they cannot in such case be called), as in all cases he ought to do; and to be careful in all good or modern Hedges composed of White-thorn, to entirely eradicate or prevent the future growth of the stool or butt, whose stems would otherwise soon make a gap in the hedge; and which is best done by a mallet and strong long-handled chisel, to be employed in mauling off the bark and outer wood of the butt, from whence the Tree has been carefully sawn down, as far into the ground as is practicable, and after laying some dirt around and on the butt, to lay down the branches of the adjoining Thorns over the place, by which means I have succeeded in preserving a valuable Quickset Hedge, on the N W side of Woburn Park, that was as full almost as possible, of large Ash Trees, thro' its whole length: but not one of whose butts, tho' so tenacious of life, survived this treatment, and the only trouble experienced, was with some that had previously been felled without this precaution. Young Trees, properly prepared in the Nursery, for removing at a greater age than usual, should be then carefully planted, not in the places of the former ones, but midway between them, if properly before apportioned as to distance, and be carefully and unremittingly thereafter attended by the Pruner, until arrived at the proper length of clear stem, as before, carefully taking out from time to time, any

any which cannot be so trained. By which system, the profits of the Landlord would be no less improved, than his eye, and that of his friends and neighbours would be gratified, at the appearance of his Estate: and no alarm could then be felt, at that reduction of unprofitable Spring Woods and Plantations, on all good Soils, on which I have before insisted, on the part of our increasing population, dependent on and enriching foreign Farmers, in an unparalleled degree, by the annual purchase of their *Corn*, and Flour. Oak, Larch, Scotch Fir, Spanish Chestnut, Beech, and Sycamore, seem to me the preferable Hedge-row Trees; Ash, Elm, and Poplar, are more injurious by their roots, and some of them, by springing from the roots, can scarcely be again destroyed.

As the subject of Oak Bark is referred, by the "Plan" of this Report to the next Section, I shall till then also defer my Notes, as to the Prices of Oak Timber, &c.; and proceed with my Alphabetical Notice of the remaining Forest Trees and Woods.

29. Oziers (*salix viminalis vitellina*, &c.) are cultivated on lazy-beds, in low and moist places, in Ash, Bretby, Calke, Drakelow, Eggington, Etwall, Great Wilne, Ingleby, Markeaton, Measham, (Bleach-mill dam), Mellor (Mill-dam), Repton, Tresley N, Willington N, Wingerworth S, &c.

In the delightful grounds of Samuel Oldknow of Mellor, several islands are formed in the shallow parts of his large Mill-dams, on which Oziers of different sorts are planted, that cut annually to good profit, and afford a harbour for Wild-ducks in considerable numbers.

Mr. William Stringer of Repton, rents several pieces of wet or peaty Land, in Willington and other places,

 for

for cultivating Oziers on a large scale, the cuttings of which, he employs in *Basket-making*, of all the different kinds: the shallow spell or split Wooden Baskets, principally of Ash and Hazel, I believe (Vol. I, p. 367), of which such general use is made throughout the Mining Districts, are made in All Saints Derby, Chapel-en-le-Frith, Chesterfield, &c.

30. Plane (*platanus orientalis*) are very fine in Bradby Park, where they were planted about the year 1735: in Peak Forest Town also, there are some, I believe. The almost universal destruction of this Tree, which took place in the Southern parts of the Island in the Spring of 1809, probably in consequence of a sudden frost at the budding time, did not I believe extend to Derbyshire.

31. Pear, Wild, or White-beam (*cratægus aria*) grows in the Limestone Rocks in Dove-Dale, Matlock Bath, Wardlow-hay, &c., and in the Hedges in Morley, &c.

32. Poplar, Balsam (*populus balsamifera*), or Caroline Poplar, is planted at Mellor, and is a very fast growing Tree.

33. Poplar, black, or common (*populus nigra?*) at Ashburne, Brimington, &c.

34. Poplar, black Italian (*populus nigra?*); Ashburne, Markeaton, Mellor, &c. A Tree of this kind, planted in the Park of Sir Brook Boothby at Ashburne in 1787, had in 1809, attained the height of 68 feet; it was 35 feet to the first main branch, seven feet circumference at the ground, and six feet two inches at six feet above the ground; the branches extended 45 feet across. In 1808 Francis N. C. Mundy, Esq. planted one acre and an half of ground, at Markeaton with this Tree.

35. Pop-

35. Poplar, Lombardy or Po *(populus deletata)*, at Bakewell (large), Belper, Ridgeway, &c. About Sheffield, on the confines of this County, these Trees are very common: at Ridgeway Mr. Joseph Hutton, sen. remarked to me, that in high and exposed situations, these Trees are less affected or rendered crooked, by the prevailing wind, than any other. Near the Derwent at Belper Cotton Mills, one of these Trees that was planted in 1779, being then three inches diameter at bottom, in March 1808, was 19 inches diameter, and measured 40 solid feet of Timber.

36. Sallow *(salix caprea)* has been mentioned as a hedge plant in p. 91.; it requires pruning and management, to make it grow straight and clear, for which trouble it would amply repay, by the value of its wood for the Turners', and various other uses. In some situations, Sallow Underwood Poles are most of them found penetrated, or bored with holes, near a quarter of an inch diameter from their roots, a good way up the Poles, by a sort of worm, and which retard their growth, and injure the wood, to such a degree, that some remedy, besides that of stocking up the roots and planting other wood in their places, would be very desirable. The stems of this Plant as Underwood, are very apt to swell out from the stool, like an inverted bell, and encroach much on the space of other adjoining stools.

37. Scotch Fir *(pinus sylvestris)*. This Tree, which may certainly rank after the Oak and the Larch in point of usefulness, was thought in the early half of the last 50 or 60 years, to be the only Tree adapted to Plantations on high and sandy or Grit-stone Soils, and is accordingly found alone in such situations in almost every part of the County, tho' of late it has been

 judged,

judged, in Glossop and other places, as most fit to nurse and protect Oak and Larch, and some other Trees, in the early state of their growth, in which capacity, they are however inferior to Spruce, for *shelter* to other Trees, particularly as an outside row or two, to exposed Plantations; where, if their leaders are taken off, at seven or eight feet high (without other pruning), they may be preserved as a most effectual and ornamental hedge-like border of evergreens, to prevent the access of chilling winds to the interior, and more profitable pruned trunks of the Trees in the inner parts of such Plantations, and for preventing the light being seen thro' such Plantations, which has generally an unpleasant effect. My Notes on this Tree were made at Alderwasley, Allestry N (field Belts), Ashover, Belper, Bradby Park (very large), Chapel-Milltown (large), Chatsworth, Coxbench, Dronfield, Foremarke (prun'd), Glossop, Great Hucklow, Griffe, Hazelwood-Hall (in Hedge-rows prun'd), High-Oredish, Kedleston (at Ireton House), Leam, Little Ireton, Locko Park, Mansel Park (field Belts), Mappleton N E (prun'd), Measham Field (by roads excessively prun'd), Melborne (large), Mellor, Nether-Padley, Newton Solney (prun'd), Overton (very large), Repton-park (large), Ripley (two or three prun'd), Shipley, Somercotes (Pine-hall, large), Stanesby, Stanfrey (three prun'd) Stanton-in-the-Peak (large), Stubbing, Swathwick (prun'd), Tibshelf (Hurst), Walton on Trent (large), Wingerworth, &c.

At Leam, a Fir N E of Marmaduke M. Middleton's House, was in 1808, five feet circumference at four feet above the ground, and had been prun'd to 25 feet high, without a twig.

Pine-hall House in Somercotes, is so called, it is said,

said, from a Trumpeter in Oliver Cromwell's Army, when it served in Scotland, having brought from thence some Scotch Fir Seed in his pocket, from which he raised the Trees now growing in the front of that house.

In Bradby Park, a Scotch Fir, growing *km.* S W of the Hall, measured in 1809, nine feet circumference for twelve feet high, and then had large arms, and a large central stem above them.

In Walton on Trent, a Scotch Fir growing in front of the old Hall in 1809, measured six feet seven inches circumference at four feet high, and was 40 feet high.

In Glossop, in 1809, Scotch Firs squaring eight to twelve inches, and measured with their Bark on, without allowance, sold at 2*s*. to 2*s*. 3*d*. per foot.

A Scotch Fir, growing near to the S E corner of Sir Joseph Banks's Summer House, on the S E of Overton Hall, measured in April 1808, four feet four inches and a half in circumference at four feet above the ground; much larger Trees than this, are growing S W of the Hall. In January 1811, 44 Scotch Fir Trees, felled from the W side of the Birch Grove, S W of the Hall, of about 100 or 110 years growth, were sold by Sir Joseph's agent for 262*l*.

The Scotch, Spruce, and Larch Trees planted on some plots, at Stanton-in-the-Peak, about 40 years ago, in the Park of Bache Thornhill, Esq. were valued in 1809, at 1000*l*. per acre.

The butts and roots of Scotch Firs, are generally left in the ground, when the Trees are felled, in this and most other Coal Counties; perhaps it might answer, to take these up to extract the *Tar* from them, as is practised in Sweden, the particulars of which process may be found, in the Library of the Society of Arts, in the Adelphi, London.

38. Sil-

38. Silver Fir *(pinus picea)*. These I saw growing in Kedleston (at Ireton House, large), Overton (very large), Sutton in Scarsdale (young), Wingerworth E (large), &c. The largest Trees of this kind in the County, I believe, are growing S W of Overton Hall, the seat of Sir Joseph Banks, Bart., one of which measures eight feet circumference at four feet high; another nine feet one inch at four feet, and this Tree holds 13 inches diameter at 65 feet high.

39. Spanish or Sweet Chestnut *(fagus castanea)*. These Trees I noticed at Belper, Bradby Park (planted in 1735, prun'd, fine), Calke Park, Chatsworth (fine), Holbrook (large), Hopton, Leam, Little Eaton, Mellor, Stanesby (fine), Stoke, Sutton in Scarsdale, Upper Padley Wood, by the Derwent side, &c.

Some of these Trees S E of Chatsworth House, have 50 feet of clear stem without a bough. In 1808 Philip Gell, Esq. planted 4000 of these Trees on the Shale S of Hopton, where they appeared to grow much faster in the first yeat than Oaks or Larches, in the same Plantation. Some Spanish Chestnuts were planted on a steep bank N W of Little Eaton by the late Mr. Francis Ridford, which in 1809 were very flourishing, but some of them had been prun'd too much at once, and had thrown out fresh shoots, which, with judicious pruning, will scarcely ever happen. This Tree never ought to be felled but in the Spring, before leafing, on account of the value of its Bark in tanning, in which it is little if any, less efficacious than Oak Bark.

40. Spruce Fir *(pinus abies)*, these have already been spoken of, p. 264, as nurses to shelter Oaks and other deciduous Trees, which will often be found to grow up through the long lower branches of Spruce, left thus without pruning on purpose for shelter. I noted

noted these Trees in Chatsworth Park (large, but knotty), Glossop (large, in Lightside Plantation), Great Hucklow, Haddon N E, Ingleby (tall), Shipley N W, (fine), Stanton in the Peak, &c. It is probable, that none of the above, or any others in this County, are equal in size to the Spruce, and other Firs growing at Lyme Hall, near its borders, in Cheshire.

41. Sycamore *(acer pseudo-platanus)*. I noticed these Trees, of the common sort, in Matlock Town (large, spreading), Mellor, Peak Forest, Shottle (large, at Alton), Sudbury Park, Walton on Trent (large, at Old Hall), &c.; and of the sort with variegated leaves of white and green, in Ashover (at the Butts), Hopton Hall, Tissington Park, Wormhill, &c. Where Rabbits very much abound, as in Sudbury Park, it has been found, that they are less disposed to injure the Bark of these Trees when young, than any other kind of Tree. Mr. James Pilkington, in his "View of Derbyshire," Vol. I. p. 474, mentions a sort of Wine being made from the sap of this Tree, in some places.

42. Weeping Willow *(salix babylonica)*. Of this beautiful Tree, I saw two good specimens, at Lullington and at Shardlow.

43. Weymouth Pine *(pinus strobus)*. I noted these Trees at Chatsworth (fine), Doveridge, Measham, Wingerworth, &c.

44. White Willow *(salix alba)*, are dispersed in different places through the County. In March 1808, Philip Gell, Esq. of the Gate-house in Wirksworth, felled a Tree of this kind at Warmbrook S of the Town, that was three feet diameter, and of which 156 solid feet was sold and delivered at Messrs. Strutts' Works at Belper, at 2*s*. 6*d*. per foot: Mr. G. has several other

very

very fine Trees of this sort, yet standing. I heard of no instance of the peeling of the Bark of this Tree, or of the Crack Willow *(salix fragilis)*, in the Spring season, in this County, altho' Mr. Henry Holland states, in his Cheshire Report, p. 327, that the Farmers there, after trial, had in 1806 given 5*l*. per ton for Willow Bark.

45. Yew *(taxus baccata)*. Many ages ago, it seems to have been a custom, to plant these trees in the Church-yards, where I noticed them still remaining in Darley (very large), Edlaston, Hartshorn (large), Hathersage, Shirley, &c. The Yew in Darley Church-yard, in 1808, measured 33 feet in circumference, at five feet above the ground. They grow also in Ashover, Barlborough N E, Birkin Lane, Holy-moor-side (many), Matlock, Newton in Blackwell (many), Oakerthorpe, Smalley, Tissington (on the Town Spring), &c.

The withered leaves and branches of this Tree, have proved fatal to great numbers of Cattle that browsed them; and in October 1797, the Son of Francis Warton in Ashover, was poisoned by eating of the berries of this Tree, as I was informed.

The planting of the drier parts of the high moors in the Peak Hundreds, with large masses of thickly planted Scotch Fir and Larch, seems a most desirable object, and no doubt need be entertained of their succeeding in all such situations. After 20 or 25 years, fields might be cleared on all the leveller parts of these, by the cutting down and disposing of the Firs; in the mean time, the destruction of the heath, and amelioration of the soil would be facilitated, by the smothering shade of the Trees, and the annual fall of their shack or foliage,

foliage, and the fields thus sheltered by surrounding belts, might, by the use of Lime, soon be brought into profitable cultivation.

The planting of *single Trees* for ornament, in Parks or Grounds, or for shade for Cattle in Summer, is treated of by Mr. Francis Blaikie in an able manner, in his "Farmer's Instructor," before quoted, p. 38.

In Calke Park I saw the single young Trees protected from the Deer and Cattle, by very well-contrived frames or fences of rough wood, much the widest at top, by which two or three useful objects were accomplished at once: the boughs could not be cropped by the Cattle, the stems of the Trees were in no danger of being galled or chafed by the top of the fence, in high winds, and the large Cattle could not approach to trample and compress the ground too much on the lateral roots of the Trees: the galled and broken state of many fine young Trees that had been planted a few years in the Park at Foremarke Hall, and protected, or rather were intended so to be, by frames widest at bottom and very narrow at top, formed a perfect contrast to what I have mentioned above. In the Earl of Chichester's Park in Sussex, I saw the single young Trees protected from the rubbing and treading of Cattle, by a heap of the roughest and ruggedest flints that could be procured, being laid about a yard diameter, and four or six inches thick round the foot of each Tree; and from which also, another good effect was experienced, that of protecting the Roots of the young Trees in a considerable degree, from the drought of the Summer: sharp angled rubble stones would probably answer in the same manner, in the Derbyshire Parks and Pastures, where single Trees are raising.

FOREST

## FOREST PRUNING.

I have given this subject a separate head, as most proper to be introduced in this place, on account of its immense importance, altho' the printed "Plan" delivered to me, and other Surveyors of Counties, does not contain a mention of the subject: and which circumstance, probably, explains the reason, that in the Reports on five of the Counties that are adjacent to Derbyshire, the word *pruning* does not, I believe, occur in this Chapter, not even in that of the West Riding of Yorkshire, altho' it contains the residence, and exhibits the practice of Mr. *William Pontey* at Huddersfield, whence this highly beneficial practice has been spread into almost every County in England, by his individual exertions, and thro' a wider field than the English Counties, by the publication there, of his excellent work, the "Forest Pruner," and might have given reason to expect some account at least of this important point, in the management of Plantations and Woods, in the West Riding Report: the Nottinghamshire Report only incidentally mentions pruning* to have been practised in the Hon. R. Lumley Savile's Plantations, about the year 1774 (pages 76 and 77), but without any account of the process or recommendation of it, or otherwise, by the Reporter. I conceive, therefore, that I shall perform an acceptable service to many, in giving as many particulars of the early

* The shortening of the *Roots* of Trees, or taking off or shortening their *Branches* at the time of planting, mentioned in this Report, p. 63; the shortening the Branches of *Nurse* Trees, that they may not overhang more valuable ones, p. 67 (or p. 97 of the Staffordshire Report); or the cutting off of *dead* branches, p. 67, can scarcely any of them be denominated Forest Pruning, in the sense Mr. Pontey and myself use that term.

early practice of pruning, and of its effects in this County, as I have been able to collect: to state the different instances that I have observed or heard of its recent practice there, with some account of the principles, and practical rules for the pruning of young Plantations.

The earliest and most satisfactory instance of pruning that I have noticed, was performed in the Earl of Chesterfield's Park at Bretby, on numerous fine Oaks, Ash, Chestnuts, Beech, &c. planted in rows about the year 1745, by Mr. Thomas Underwood the Gardener (who died about 1770, and was buried at Repton), large holes being dug for planting each Tree, that cost 2½*d*. each, it appears, and into each of which a cart-load of good soil was put, previous to the planting of the Trees, which were of good size, and were well fenced from the Deer; and they were *pruned* and trained with great care as long as Mr. U. lived (see Mr. Francis Blaikie's "Farmer's Instructor," p. 32), and had Mr. Burton his Successor but followed his excellent example, his Lordship's Timber would now have been immensely more valuable and handsome, and been a pattern in all respects, as to management and perfection of Timber.

The Oaks in Sir Francis Burdett's fine Woods at Knowl-hill in Ticknall, and the Avenues leading thence to Foremarke Hall, were excellently trained and managed by Mr. Wm. Gregory the Gardener there, about and previous to the middle of the last century: the Oaks in the Woods were trained up to straight and clear bodies, 20 to 40 feet in length; and when Sir Francis had a large Sale from these Trees, a few years ago, they were allowed by all that saw them, to be the best quantity

of

of Timber, that had been felled in all that part of the Country for a great length of time.

The fine Oaks, Spanish Chestnuts, and some other deciduous Trees on the S E of Chatsworth House, were in the process of pruning, with great judgment, about the year 1750: but it is lamentable, that at that, as well as at most subsequent periods, the pruning of Firs was not thought advisable, and the snags and knottiness of these, in consequence, may serve to convince any one, of the evil of neglecting early and judicious pruning of these, such as was applied to the other class of Trees.

The late Sir Henry Cavendish, Bart. (Lord Waterpark's father) took great delight and pains in the pruning and training of his Plantations at Doveridge, and in recommending and explaining the practice to his friends: about the year 1780, he superintended the pruning of several Trees for Mr. Mundy in Markeaton Park, when on a visit there, with a fine tooth'd Saw, in order to recommend its more general adoption.

About the year 1791, Francis N. C. Mundy, Esq. employed Mr. John Sands (late Gardener at Kedleston Hall, and the Father-in-law of Mr. Joseph Frost, His Majesty's Bailiff at Windsor) to prune his newly-planted Belts and ornamental Plantations at Markeaton, and which on examination, I found exceedingly well performed; the Trees in good condition, except from subsequent neglect; which Mr. M. informed me, had been occasioned by the representations of his old Carpenter Mr. William Ellis, and his present Gardener Mr. Thomas Tomlinson, the former of whom stated to me, that the Poles from the thinnings of these pruned Plantations, particularly a Belt on the hill N E of Mark-

Markeaton Park-Farm House, when split for Rails, were found to be greatly injured by the pruning: a circumstance which the Gardener seemed very eager to confirm to me and Mr. M. by stating the particulars, which, I noted down, of his having, before he left Walton on Trent, repeatedly pruned two small Plantations on opposite sides of the Road there, for General Crawford, that were sown with Acorns about 17 years ago, and that lately, when some of them were felled for Posts and Rails, they were found to have *defects* in them: and further, that Walton Wood S of Burrow-hill, belonging to the Marquis Townshend, had been pruned by his Father George Tomlinson, about 1799, and tho' he cut close and smooth, the pruning had done injury.

I begged of Mr. M. to be conducted without delay to his Timber-yard, to see as many as possible of the *spoilt Poles* that Ellis and Tomlinson had been talking of; and can't say but I was much pleased, tho' not at all surprized to find, after several cleft Oak Poles about four or five inches diameter, had been looked out by Ellis, to see, that the pruning visible in their cleft surfaces, had been close and well performed, and nearly every *defect*, as he called them, to consist in the change or rather difference of colour in the knot, from the white and clear, or straight-grained Sap Wood, that had completely formed over the cut surfaces, where the pruning had been performed: and I scrupled not then to point out, as I now maintain, that these Rails were considerably stronger, on account of this outside of *clear and knotless wood*, than if the boughs had been cut off at the time of felling, besides their being so much less tapering, and probably not less durable: and I have been thus particular, in order

to put Gentlemen on their guard against being misled by their Carpenters and others, in a similar manner, and to point out, that Carpenters and Timber-dealers, who have almost invariably been in the habit of buying Timber *notoriously depreciated in price* by its knottiness and defects, are very averse to seeing these defects remedied, or, as they would term it, *concealed by art*, and the attention of the grower; and that whenever previous pruning has been heard of, or can be discerned in the interior of the Tree, tho' it be only by a slight difference in the colour of the grain, these men are equally or more loud in their complaints, than against knots, &c.: the reason is obvious, these last would, by common consent, have lowered the price of the article! I also wish to take this opportunity to point out, the impropriety of judging of the effects of pruning, by the Poles thinned out *a few years afterwards*, since it is to be presumed that these have profited even less by the operation, than those left standing; and that in such, the main end of pruning young Plantations, that of inducing the growth of a valuable and perfect coat of clear and knotless wood, over the exterminated branches, which must somehow happen, if clear wood is at all obtained, has *not had time* to be accomplished.

I beg further to state, that when I reached Walton on Trent, in the course of my Survey, I enquired for Mr. George Tomlinson, and requested him to accompany me to the two small Plantations near Mr. Francis Hamp's House, which I had passed on my way from Drakelow: and found the northern one, that had been a Garden of 20 perches (far less than represented), was sown thick with Acorns in 1793, and tho' thinned and pruned too, perhaps *when very young*, for I could discern

cern no mark of pruning on them, were when I saw them in 1809, only four feet apart, and smothering one another: the other Plantation of 30 perches S of the Road, was an old waste Marl or Clay-pit formerly, probably, and was thickly planted in 1792, with three year old Oak and some Ash plants, which have been thinned since the other Plantation, and the largest of the Poles cleaved into two inclosing Posts; in which, I could not learn from Mr. T. that any material defects were discernible: and tho' these were indisputably the Plantations mentioned at Mr. Mundy's, he was desirous of shewing me a small Plantation of about Two Perches, by the Road side, on the west of Burrow-hill, that was planted with Oaks and Ashes at three feet apart or less, for the Marquis Townshend, about 1780, which his son Thomas Tomlinson, before mentioned, thinned and pruned in 1797: and which has been said to have starved them, and made them mossy, and prevented their growth since, but none of them had been felled since the pruning, in order to see how it had affected them: on viewing these Trees attentively, I ascribed the alleged check in their growth, to their sudden exposure, by too copious pruning and thinning at once, and their mossiness to their being still much too thick; and what I saw most to complain of, was, the want of proper and *gradual* thinning, in this small Oak Plantation.

I went with Mr. T. to Walton Wood, which is under his care, consisting of very tall Ash and Elm Trees, principally, with scarcely any Underwood, and where on every side I saw dead and rotten underboughs, or else long dead snags, instead of the *pruning* that I had been told of at Markeaton, as above. In justice, however, to Mr. Tomlinson the elder, I men-

 tion,

tion, and with pleasure, that tho' formerly an advocate for Snag, or Live-stump pruning, particularly in Hedge-row Trees, he showed me, with marks of his approbation, the close and judicious pruning of young Oaks, &c. near his House, done by order of Edward M. Mundy, jun. Esq. of South-Sea Hall in Walton: and spoke in commendation of the recent recommendation of Mr. Trumper, the Timber Agent of the Marquis Townshend, to have his Lordship's Plantations of Firs and Oaks (those above-mentioned in particular) thinned and pruned.

In Edward S. W. Sitwell's Park at Stanesby, the pruning of Oaks, Spanish Chestnuts, Ash, &c. to about fifteen feet in height, was well conducted about the year 1784, but was unfortunately for a long time afterwards neglected.

Bache Thornhill, Esq. when a young Man, pruned the lower Branches from many fine Scotch Firs and some other Trees, growing in his Park at Stanton in the Peak, but unfortunately discontinued the practice, until about the year 1793, when his intelligent Agent, Mr. Joseph Gilbert, again introduced it, tho' not on the very best principles, or quite such as Mr. Pontey teaches. The beginning of Pruning at Catton, in 1799, and the cause of desisting, has been alluded to already, page 255.

Casual instances of Pruning here occur, as in most other Districts; which may have their use, when known, in showing either what to imitate, or what to avoid. On the N of Mappleton I saw some Scotch Firs, that had been pruned several years. In the front of Francis Shacklock's Cottage in Stanfrey, three Scotch Firs planted in 1775, were pruned in the interval to 1799, to 20 feet high.

In

In the front of a House in Ripley Town, there are two or three Firs, pruned up to a considerable height. When I was at Mr. Robert Charles Greaves's at Ingleby, he showed me a Dresser, or Ironing-board, in his Laundry, that was sawn from a large Ash, cut at Donisthorpe in 1807, in which there was an excellent example of Pruning visible, performed on a branch about 1½ inch diameter, full 50 years before the Tree was fallen, as appeared by the annual layers of white and perfect wood formed over it, the inclosed knot exhibiting nothing like decay, not even in the bark that fills a small cavity on one side of it: this Tree was 25 feet long in the bole, and probably had been growing 70 years: the Bough in question was not a natural one, or that originated from the pith of the Tree, but seems to have sprung out, when the Tree in that part, was of 14 years' growth, perhaps in consequence of too copious pruning at once. I have been pleased to hear, since I completed my Survey, that Mr. Pontey had been called in, to give his professional advice and assistance as a Pruner, in Belper, Radburne, and Shirley, and perhaps in others ere this. At the following places, I saw the good effects of Pruning, and more than the ordinary attention, paid to training Forest Trees, viz.

Ashover, Sir Joseph Banks, Bart. and Mr. William Milnes (Mr. William Milnes, jun.), see p. 239 and 243.

Bank-hall, Samuel Frith, Esq.

Beard, Mr. Samuel Greatrick, Hedge-row Oaks and Ash, see p. 281.

Belper, George H. Strutt, Esq. and his Son, see p. 239.

Bradby Park, Earl Chesterfield (Francis Blaikie) see p. 271.

Calke, Sir Henry Crewe, Bart. (Mr. William Smith).

Catton, Eusebius Horton, Esq. (formerly), see p. 255.

Chatsworth, the Duke of Devonshire (formerly, and by Mr. Thomas Knowlton), see p. 272.

Cromford, Richard Arkwright, Esq.

Doveridge (the late Sir Henry Cavendish, Bart.), see p. 272.

Edensor, the Duke of Devonshire (Mr. Thomas Knowlton).

Etwall, Mr. John Heacock.

Foremarke (formerly), see p. 271.

Great Hucklow, John Radford, Esq. see p. 281.

Hartshorn, Thomas Hassall, Esq.

Hollinwood-Common, Duke of Devonshire, young Oaks.

Hopton, Philip Gell, Esq. Beech, &c.

Leam, Marmaduke M. Middleton, Esq.

Locko-Park, William D. Lowe, Esq. (Thomas Coverdale, his Gardener).

Longford, Edward Coke, Esq.

Markeaton, Francis N. C. Mundy, Esq. (formerly), see p. 272.

Mellor, Samuel Oldknow, Esq. see p. 281.

Newton-Solney, Abraham Hoskins, Esq. see p. 281.

Osmaston Cottage near Shirley, John Berresford, Esq.

Palterton and Scarcliff, Earl Bathurst (Mr. James Dowland), see p. 73.

Shirley Park-Wood, Edward S. Cox, Esq.

Stanage in Wingerworth, Sir Thomas Windsor Hunloke, Bart. (Mr. John Gratton, jun.)

Stanesby, Edward S. W. Sitwell, Esq. (formerly), see p. 276.

Stanton

Stanton in the Peak, Bache Thornhill, Esq. (Mr. Joseph Gilbert), see p. 276.

Stoke, the Hon. John Simpson.

Swathwick, Sir Thomas W. Hunloke, Bart.

Taxall in Cheshire, Francis Jodderel, Esq. (Mr. Joseph Coleby), Cheshire Rep. p. 200, but where the *Pruning* is not noticed.

Ticknall (formerly), Elm Avenues, &c.

Walton on Trent, Marquis Townshend (Mr. George Tomlinson), Edward M. Mundy, jun. Esq. see p. 275, 276.

West-Handley, Duke of Devonshire, young Oaks.

Willersley, Richard Arkwright, Esq.

As some persons yet affect to doubt the propriety of Forest Pruning, I beg here to quote the answer of Sir Joseph Banks, the worthy and able President of the Royal Society (whose scheme of future Pruning in Ashover has been mentioned, p. 243), to the Fourth of Lord Glenbervie's Queries respecting Timber, which will be inserted presently, that I have extracted from the Manuscript in His Majesty's Office of Woods, viz. "All Forest Trees should be pruned, annually, till they have attained a very considerable growth: the Branches should be cut off close to the Stem, and quite smooth: a Draw-knife is the best tool for effecting this. The Writer has no doubt, that *the cost of annual pruning, if judiciously done, will be repaid with tenfold interest.*" In which opinions I doubt not that the worthy Baronet is borne out by experience, on his Lincolnshire Estate, in the training of Hedge-row Timber in particular: it was with pain, therefore, that I read in answer to the same Queries, by the President of the Horticultural Society, a Gentleman not less, but per-

 haps

-haps more, famous as a vegetable physiologist, Thomas Andrew Knight, Esq. as follows: "Oaks drawn up into long naked Poles, either by Neighbours, or by *Mr. Pontey's Plan* of Pruning, may be considered as *spoilt*, and it will generally be found best to fell them, and train up again from their stools:" because, a representation of Mr. Pontey's principles of training Oaks, so *marked*, (in which I have followed the Manuscript), and so untrue, is unjust, and calculated to do great mischief: on which account I trust that I shall be excused for preceding its further publication, by what may prove an antidote: fortunately, the words "train up again," show that Mr. Knight is aware of, and admits the necessity of, *art being used* in the rearing of Timber, which is a point of the utmost consequence to be established; and the same is not left by Mr. Knight to be inferred from these words alone, for in answer to a preceding Query, respecting the best method of rearing Oaks, he, after disapproving of the sowing of Acorns in Forest Lands, recommends nine feet Plants, to be planted out at eight yards apart, and to *train* such by a "proper Pruning—*high and straight* for Plank, and *low and crooked* for Knee-Timber:" how he would effect this, but on the very principles that Mr. Pontey has so ably developed and enforced, and so long and successfully practised, we are untold, here or elsewhere, I believe; and Mr. Knight may safely be challenged, to point out any passages in the "Forest Pruner" of Mr. Pontey, that authorize, or directions that would lead to, the *spoiling* of Oak Plantations, by rendering them *naked Poles*. But I must proceed to notice some few further particulars of the Pruning at the above places.

At Bretby, Mr. Francis Blaikie has practised Prun-

ing

ing on the principles explained in his late Pamphlet, called the "Farmer's Instructor;" he expressed himself averse to too much pruning, unless the Trees are very thick in a mass, lest they grow top-heavy, Oaks in particular.

At Great Hucklow, John Radford, Esq. commenced the pruning of his young Plantations (about 40 acres) as soon as the Trees had taken effectual root, and shot vigorously; and has found the month of August the best season, and that in which the deciduous Trees are least liable to break again, after pruning.

At Mellor Mills, I was particularly gratified in seeing the judicious pruning carrying on by Samuel Oldknow, Esq.; and cannot but recommend this Gentleman's delightful Grounds, as perhaps the best specimen of well-conducted improvement, that I am any where acquainted with.

In Newton Solney, Abraham Hoskins, Esq. pruned many of the Oaks and Firs in Bladon Wood, in 1802, close and well; yet many persons would fain have persuaded him, soon after, that he had *spoilt* them: I mention the circumstance, with the hope of inducing such persons, and others of similar sentiments, to review these spoilt Trees, from time to time, and judge for themselves.

The mention of some instances, where I saw pruning injudiciously performed, is a necessary piece of justice, to put others on their guard against imitating the same.

The Hedge-rows Trees, near Jow-hole in Beard, mentioned above, were too much pruned at once, but were cut close and neat.

In a small Plantation, surrounding the Chert-Pits ¾ *m.* N W of Bonsal, some Larch, that stood wide apart, and had been excessively pruned, had thrown

out

out numerous small new Branches: and one that had been headed entirely, by accident, had thrown out new Branches.

On the N W of Little Eaton, I saw some fine Spanish Chestnuts, too much pruned at once, and which had occasioned the throwing out of numerous new and unnatural shoots.

By the Roads' sides, on the East side of Measham, near to Measham Field, I saw some Scotch Firs, literally bare Poles, owing to excessive and injudicious pruning: it has been from occasional instances of such egregious folly as this, that much of the clamour so fatally raised against Forest Pruning of all sorts, has originated and been kept alive: and to which the ill-judged attempts of some others, to reclaim and improve old and too long neglected Trees, by pruning, or rather lopping of them (see p. 222), have much contributed.

A pretty extensive and close attention to the various rural improvements, going on in the country during several years past, has convinced me, that the management of Wood Lands, particularly those which have been planted within the past century, and of Trees in general, is far more behind than any other, tho' of such great importance; and that a degree of profit and advantage would flow from the general adoption of better principles and practices, in this respect, unknown in almost any other branch of rural economy: and I cannot but cherish the idea of the publication, and extensive sale of Mr. William Pontey's "Forest Pruner," in 1805, and the wider extension of his professional labours since that period, in directing and superintending Pruning, forming the commencement of a new *era*, in this essential department of rural affairs: I shall therefore,

therefore, I hope, be performing an acceptable piece of service to many, in giving some of the leading principles, and explaining the practice of Forest Pruning, in this place, according to my own method and conception of it, agreeing however in all essential points with the able Work above quoted, and which all those who have any considerable interest in Plantations, ought attentively to study.

I shall first endeavour to shew the necessity of *Forest Pruning*, by calling the consideration of my Reader to the first stage and progress of a Tree towards its maturity, and becoming Timber; which last, almost every one knows, is valuable, for all but a very few purposes, in proportion to the straightness of its grain, or freedom from knots: young Trees of most kinds, by the time that they have acquired the size of a goose-quil, are furnished with several lateral branches, that originate at the very pith of the stem: and in considering how very essential these lateral branches *then* are to the growth and existence of the plant, the principle whence a clear trunk without branches or knots is to spring, can scarcely be perceived: as we contemplate the further growth of the Tree, by steps or periods, of one or two feet in its height, we shall perceive, however, a constant repetition of the same process, of numerous small branches or twigs, succeeding, and originating at the very pith or centre of the main stem; and it must strike every one, that if each one of these laterals, continued ever after, as essential to the health and existence of the plant, as they were at the time of their first production, that clear and knotless Timber would be unattainable: experience, however, teaches, that the greater part of them are only *of temporary importance to the Tree*, and yet, that there is no

no fixed or determinate order or period in which these laterals become, in great part, non-essential to the health and perfection of the plant, or direct means provided by nature, for their removal when no further useful, like the falling of the leaves of most Trees in the Autumn: nor is there any thing like joints or articulations provided, at which these laterals, when no longer of use, separate, when accidental or designed force plucks them from the trunk, but either an absolute fracture, or a cutting of the fibres of laterals, closely connected and joined as they are, with those in the centre of the trunk, must be made, and that nothing like the production of bark *to cover the stumps* or ends of laterals, so severed, ever takes place, nothing being more evident, than that in every instance, the wounds of Trees are healed or repaired, by the gradual approach of the bark of the trunk from the sides of the wound, until at length the bark from its different sides, meets and unites: in a state of nature, when neither man or other animals assist in the removal of useless laterals, on the lower parts of the trunks of Trees, it will be seen, that they first decline in vigour, owing in a great measure to the shade, either of the higher boughs of the same or those of other Trees; and in consequence of a certain degree of exclusion from light and air, they at length die, and in process of time rot, and the small ones fall off by their own weight, nearly even with the bark of the trunk, but leaving a small conical projection of the central parts of the twig, which the bark of the trunk, in its increase, quickly covers; and so true is it, that Nature has provided no means for the healthful separation of even the smallest lateral twig, from the trunk of a Tree, similar to the falling of a leaf, the shedding of the horns or teeth of

animals,

animals, &c. that even the putrefactive or rotting process that has been mentioned, is unable to effect it; but if a dead branch be not in a reasonable time removed *close to the trunk*, so that its bark may colapse, and closely cover the remaining dead wood, rottenness will continue to proceed, and penetrate to the pith and adjoining central parts of the main stem: the active vegetable life of all Trees, being confined to the Bark, and a very few of the last annual layers of Sap Wood, and their central parts, or *heart* as it is called, both of the trunk and branches, is so far dead, during the whole growth of the Tree, that air and water being admitted to it, would cause it to begin to rot, even more rapidly, as I am inclined to think, than felled and seasoned Timber, would decay in like circumstances.

These considerations, which no one acquainted with the growth of Trees, or who will take the trouble to examine the trunks of growing Trees attentively, can dispute or doubt, and which will receive ample confirmation by the cleaving of Trees, exactly thro' their pith (which often better exhibits the fibres and small knots than sawing does), and observing near to it, the insertion, the remains, and the terminations of all the *natural* branches which the Tree has ever had, as well as those of the *unnatural* branches, which may have originated in the bark at some distance from the centre of the Tree during its growth, in consequence of an excessive diminution of the healthy branches above, by pruning or smothering, &c. and it will further appear, by this attention to the knots occasioned by *all the minuter branches* which the trunk ever had, that the growth or production of clear or straight-grained wood, is not occasioned by a lengthening or drawing out of the stem between the knots (as some have mistakenly

takenly imagined), as the small distances of these original lateral branches, will prove, but solely in consequence of perfect and healthy *bark*, forming over the termination or aperture, whence such branches protruded from the trunk, and the successive forming of annual layers of White or Sap Wood under such bark in the further progress of the Tree's growth: in Fir Timber, this original distance or heights of the laterals from each other, still remaining the same as at first, will be most easily traced in sawing such Trees, owing to several of them springing exactly at the same height, as very rarely happens with deciduous Trees, and it must not therefore be concluded, because some of these small original knots, may not appear in any one, or even two sections or splittings of a Tree, that they do not exist at their original distances, in other directions from the pith, than that which the cleft or sawn surfaces have followed.

Such being the facts, with respect to the growth and formation of *Timber*, it becomes as obviously the province and the duty of man, to attend to and assist the operations of Nature, with respect to it, as in any of the instances of care and art in Horticulture, or Agriculture, or even in Surgery, to which, in many respects, the principles and operations of the Pruner are allied.

But before I proceed further, it will be necessary to notice an important distinction that exists, between *Forest pruning* and *Orchard* or Garden *pruning*, arising from the well known fact, that Trees or Shrubs are never in the proper or best condition for producing Timber or *Wood*, and *Fruit* at the same time: a youthful vigour being essential to the former, and a certain stage of maturity either naturally arrived by age, or induced by art, being essential to the production

tion of Fruit, in all perennial or long-lived vegetables, as of the Tree kind; and that fruit-bearing Trees, or those much given to Seed, are almost always slow growers, as has been hinted already with respect to Ash, p. 233*, and on the contrary, young healthy and flourishing Timber Trees, or Hedges, &c. seldom produce much Seed, and often none at all, for years together: and that while the art of the Orchard Pruner is displayed, in producing healthy and numerous flower-buds and bearing branches, that of the Forest Pruner consists in counteracting, and putting off the maturity of Trees, in favour of further and luxurious growth, such as the Gardener often finds prevailing, in spite of all his endeavours in Wood-bearing Trees, as such are called. Hence it is, I conceive, that Orchard Pruners or Gardeners, have often failed in their attempts at improving Plantations of Forest Trees, and that many among them, have been the most determined opposers of *Forest Pruning*, as a thing unnecessary as unavailing, or even mischievous, as in the cases which I have already mentioned.

If we examine attentively, the clear boles or bodies of Timber Trees of moderate height, we shall often observe, that the same are cylindrical, or have no sensible tapering below the first or lowest branches, and that each branch effects a material *diminution of the size* or diameter of the trunk above it, especially if two of such occur at or near the same height, and that when several branches spring at or very near the same place in a deciduous Tree (as all those of the Fir tribe do),

* It is when Hazel, Elder, Barberry, and some other Trees, begin to bear much Fruit, that they throw up such vigorous and straight young shoots or succors from or near to their roots, as vents for the extra quantity of sap, that their slow growth is unable to expend.

that

that it rarely happens, that a stem or leader can be traced above such principal forking, or forming of the head of a deciduous Tree; and that should a central branch or leader have been at first produced (such as there always is between the annual tiers of the Fir tribe), that the same is in a weak state, compared with the side branches from or below the principal fork; or is dieing, or perhaps dead, and forming what is called a stog-headed Tree.

The circumstances, of the vital functions of the trunk of a Tree being all carried on, in or almost immediately under its bark, and in vessels carrying up and returning the Sap, which are impeded by every branch or wound in the bark, that diverts them from their straight course from the roots towards the parts of the Tree, above such branches or wounds, as well as a superior portion of such Sap being diverted or drawn by the action of the leaves, into such obstructing side branches, and greater in proportion as they are more healthy and vigorous; these will serve to account for the above appearances, of the tapering of branchy or knotty Trees, and their want of height, in too many cases; and to explain the reason, why a principal part of the Pruner's art and attention is to be directed to the preventing of main Branches springing from the Trunk, at or *near the same height*, but rather, that such a position should be taken by all the larger branches, in a growing Tree (of the deciduous kinds), that they may in no place wholly, or nearly encircle, or *beset the stem*, as Mr. Pontey expresses it, but that they may leave as many and as wide strips of clear bark, without branches, from the roots of the Tree upwards, to the very leader of the Tree, as is practicable, and with as few and as easy bends out of one straight

course,

course, to each of such strips of clear bark, as is attainable. Such a young Tree, having no very large boughs, but a sufficient number of pretty equal ones, properly disposed, is in the most favourable state for increasing the height and thickness of its straight Trunk, which, by further and progressive pruning, is to be rendered entirely free of branches, as soon as sufficient height, and a well-formed Head, of sufficient magnitude, will permit, and not sooner: and by the adoption of which principles, in the practice of training Forest Trees, not growing too near to each other (which *thinning* is to prevent), "naked Poles," and spoilt Trees, need not in any case be apprehended, but *Timber*, vastly more valuable than any that accident or neglect has hitherto produced.

Sir Joseph Banks, in his answer to the thirty-eighth of Lord Glenbervie's Queries, that follow herein, asserts, that on the Red Marl (as a soil particularly favourable to Oaks), tall and *straight* Oak Timber, will produce to the grower ten times as much money, in a given time, as crooked Timber, tho' applicable to the Knees of Ships! As to knottiness (tho' such were sound, and tapering), no one can be ignorant, how much such depreciate the value of Timber.

Mr. Pontey shows, that 40 feet distances are necessary (or only about 27 to the acre) to the unassisted growth of large Oak Trees, owing to the flat, spreading, and close form of their Heads; but that the properly trained, open, high, and conical Heads of such Trees will admit of their standing at 25 feet distances, or about 70 Trees on the acre, and of the most profitable kind. What an inducement to pruning and management!

The most common error into which Pruners have

fallen, is that of attempting the reformation of previously neglected *large Trees*, of the deciduous kind, by the amputation of their great living arms (see p. 222), and it has been with much concern, that I have heard instances of Mr. Pontey's zeal, in Ornamental Gardening, having drawn him, and led his employers, into this error: which I mention, in order to distinguish between the truly excellent principles and practice which this Gentleman has explained and introduced, for training either useful or ornamental *young Trees* of all sorts, and even for preserving and mending the appearance of large neglected Trees, or that have suffered from accident, in some *particular cases*, and intemperate, or occasionally misguided zeal, in the application of this art: and to express my decided opinion, as being confirmed by all intelligent Wood-owners, and their Agents, whom I know, that *profit* is *never to be expected*, but more generally disappointment and loss, from the cutting off large live arms from Forest Trees: the Axe of the Feller is, most commonly, the only fit remedy for Trees judged to be in want of such treatment, in order to make way, as speedily as possible, for pruning and training successors, under more favourable circumstances. With the Fir tribe it is somewhat different, owing to their arms seldom bearing any considerable proportion to the size of the trunk, their knots not being so liable to decay as those of all deciduous Trees, and their not being liable to shoot again from the trunk; and with them, it is never too late to begin very close pruning, conducted with moderation, and regard to my rule, of never diminishing the live twigs and foliage of the Tree, by pruning off more than one-fourth part of them at the most, in any one season: but all *snags and dead branches* ought certainly, for appearance sake, to

be

be instantly removed; and pruned Firs, standing any considerable length of time afterwards, can scarcely fail of paying amply for the trouble, however much previously neglected. The first Thinnings, of even proper *nurses* in Plantations, pay amply for the pains and expense that has been bestowed on their pruning, and the second and subsequent Thinnings in increased proportions.

Mr. Pontey has ascertained, that when Trees are producing numerous and very luxurious side-shoots, after being headed and lopped (like Hedge-row Trees, too often), they are making no perceptible increase in the size of their Trunks: and he relates his experiments on two Poplars, under almost similar circumstances, except that one of them was lopped and headed at 14 feet high, all the young branches of which were removed in every succeeding Winter, and the other was left entirely to Nature; and he found, that the latter had, in four years, increased from 2 ft. 2 in. to 3 ft. 1 in. in circumference, or had more than doubled its area, or horizontal section of the trunk, and its height and branches were greatly increased; while the other had produced only useless twigs, and had made no perceptible increase in its trunk! What can more strongly show the impolicy of Landlords suffering their Tenants to head, and *frequently lop young Pollard Trees*, in their Hedge-rows, or to prime up, at short intervals, all the Elm, Ash, and other maiden Trees therein, to almost a single top-twig! as is quite common in Middlesex, and several other Counties; thus, suffering little increase to take place in the trunks of the Trees, but only comparatively worthless twigs are produced in its place; and by the repetition of this priming, the whole surface of the trunk becomes so covered by wounds and

 dead

dead or rotten knots, that in time the Tree, tho' of small size, becomes fit only for Fire-wood. The slow growth of *Birch* Poles, that are annually trimmed for Broom-making, of the bodies of *Willow* Pollards by the sides of some Brooks, &c. are ample proofs of the above: and Mr. Pontey is perhaps right in inferring, that too many and large, as well as too numerous young and luxurious branches, are alike operative in decreasing the growth of the Timber in the Trunk, in comparison with heads of a moderate size, and proper form.

One very important use of the heads of Trees, in exposed situations, having a proper form, is, that if the large branches grow principally on one side, the action of the Wind on such, is apt to *twist* the trunk*: I have seen a large Pear-tree, that in the course of its growth had turned more than once round, owing, apparently, to its branches being principally on one side: if the branches springing from the upper part of the trunk or leader of a tree, are too few, or they are not open-headed, the accidental breaking or declining of particular branches, and the increase of others, is apt to produce this and other evils, from which heads of proper form and size are in a great measure exempt.

Young Trees should never be bent much out of their vertical position while pruning them, as such violence is very apt to split them, or to rupture, or greatly injure the fibres of their Trunk: proper Steps and Ladders

* Mr. John Gratton, jun. of Car House, considers this evil, of twisted trunks, rather as a constitutional defect in certain Trees; which he has seen much twisted in very sheltered situations, and has even observed cases, wherein all the main branches have been twisted, as well as the trunk: the Mountain Ash being more subject to this defect than most other Trees.

ders used in pruning, and the use of the fine-toothed Saw, prevents the necessity of any such practice.

The recommendations of Mr. Francis Blaikie, in the "Farmer's Instructor," particularly intended for circulation in Derbyshire, and often before quoted, have in general called for and met my warm approbation, and that of many others who have studied and adopted the same principles of Forest pruning and management: I cannot, however, acquiesce in, or pass over in silence, his directions with regard to the pruning of *Firs*, p. 36, where he says, that "it is not necessary, and indeed highly improper, to cut off any side branches from Larch or Firs, before such branches begin to show symptoms of weakness, which in due time they will do," &c.—a doctrine which had long before been exposed, and treated with just severity, by Mr. Pontey, in the 1st Edition of his "Forest Pruner," p. 206 and 208, Note*. An inspection of the Pleasure-grounds at Chatsworth, and many other places, might convince any one, that single Firs, or those at sufficient distances, tho' of large size, may and will, if art is not used, continue to support nearly all the branches that they ever produced, in an almost equal state of vigour, those nearest to, and but little above the ground, being the longest and largest, see p. 272: and nothing is more common in Plantations, in exposed situations, and not very thick, than to see Firs and Larch having all their lower

* In pretty thick Plantations, of Scotch Firs in particular, several sorts of Lichens, or White Mosses, are apt to grow and accumulate on the trunks, and hang pendant from the branches of the Trees. Mr. William Campbell (see p. 301, Note) considers these as very injurious to the health of the Trees, by the moisture they attract, and their living, in part at least, on the juices of the Trees; and that all branches having much of this White Moss adhering, ought to be taken off by the Pruner.

 boughs

boughs alive and thriving, the Scotch Fir in particular; and I have examined thousands of such Trees in Derbyshire, whose trunks had acquired two, or three, or more inches, diameter at the ground, below the large and vigorous boughs that hung down upon the same; and yet, owing to the number of live side-boughs (decreasing in size upwards), the tapering of these Trees was such, that their whole height has often been less than my own: in *thick* Plantations, and after the Firs have acquired six, eight, or more feet in height, Mr. B.'s rule, and that of the Writers whom he seems to have followed therein, may in part at least apply, but no where else, I am of opinion; since I know from repeated observations, that pruning, begun in the Nursery upon the most luxuriant side-branches, and continued until Firs of all kinds, and Larch, have acquired the height above-mentioned in the Plantation, is highly advantageous to their growth, and that the cost thereof will be amply repaid even in the first Thinnings, as hinted above, p. 291.

Thomas William Coke, Esq. of Holkham in Norfolk, has found great benefit from pruning his Scotch and Spruce Firs in times of Snow, and spreading the branches for his Sheep to browse; of course he don't wait until they are dead, or even much declining in foliage, as some would persuade us to do.

The alledged *Bleeding*, or running of Sap from the Wounds of Firs after pruning, has proved a great stumbling-block to many, but it ought in no case, where the operation is moderately and properly performed, to be regarded; indeed, I am satisfied that the bleeding of Firs, in moderation, is beneficial rather than otherwise, since the resinous part of the Sap dries on the Wound, in such cases, and excludes the air

and

and wet, and forms the best substance that could perhaps be devised for the new Bark to close over upon.

In the year 1801, a great number of Firs were pruned in the late Duke of Bedford's Plantations near Hogstyend, on the west side of the Turnpike Road on the great Sand Hill, N of Woburn, in which a great many tiers of snags, and dead and declining branches, were taken off at once, close to the trunks, and so as somewhat to wound the live bark all round them (which always favours its growth over the Wound); and, whether owing to so many of these branches being pruned at once, or to the season, or what other cause, it so happened, that these Scotch Firs bled more profusely than any I ever saw elsewhere, the streams from the wounds covering the whole trunks with a white film, and most persons pronounced them "spoilt;" yet no perceivable mischief then followed; and last June (1811) when I had an opportunity of examining this Plantation, the Wounds were all long ago healed over, and I had the pleasure to observe, in a great many of these Firs, that were felled and sawn thro' for Rails on the spot, that a considerable thickness of new and clear Wood was formed over the knots in their trunks, in the most perfect manner; and that the Trees remaining, were in the most healthy and profitable state of growth. These circumstances I have mentioned, to show, that the occasional bleeding of Firs is not to be particularly dreaded: and here I would remark, that *Plaisters*, or compositions of all kinds, seem unnecessary in proper pruning, or such as I would wish to recommend for general adoption.

The value of Timber of all sorts is very considerably enhanced, by its being round, as well as straight and clear, and free from those *Wanes* or Troughs, so

common in the Trunks of Beech, Birch, and some other Trees, and which Mr. Pontey shows to be occasioned in most, if not every instance, by dead or declining branches, that arrest the currents of the Sap in their vicinities, above and below, which they can neither receive or pass, but throw additional quantities of it into the sides, where the size of the trunk is as unnaturally increased, as it is diminished in the hollows or wanes between them: the examination of neglected Beech Plantations, of some age, will often show this evil, in its extreme degree: and in attempting their reform, the Chisel, or rather a flat sharp Gouge and a Mallet, are the best tools, for carefully cutting off the offending branches, or snags, very close in the bottoms of the wanes, and so as slightly to wound the live bark round them, which will quickly then begin to close over the knots, and from that period the wanes will begin to decrease in depth, and perhaps in time disappear altogether.

Having, I fear, continued too long on the principles and occasional circumstances attending Forest Pruning, I shall proceed to offer some

*Practical Rules for Pruning Young Forest Trees.*

Attention to the pruning of young Forest Trees, while training in the *Nursery*, is of more importance than has generally been supposed: in looking over the beds of young transplanted Larch and Firs in particular, it will very commonly be observed, that some of their lower tiers of branches are little, if at all, inferior in size to the leader, and nearly as long, spreading out like a reversed Bell: in such cases, the point of a sharp Pen-knife carefully applied from above on the right side,

side, while the Thumb is presented on the opposite side of the Stem as a support, to take out one or two of the *thickest and most vigorous* of these side-shoots, smooth and close to the Stem, will throw proportionate strength and vigour into the leader; which pruning may be repeated, with care, on the same or succeeding tiers, as the Plant advances: and, as Nurserymen charge for Plants at different rates, according to their heights, the cost of such attention to Nursery Plants will be most amply repaid to them: deciduous Trees often admit of similar assistance from the Pruner's art; but in their first, as in all subsequent prunings, observe, never to diminish the Twigs, Buds, or Foliage of the Plants more than about one-fourth of the whole at any one pruning; and for avoiding a more sudden defoliation of deciduous Plants and Trees that have been neglected, it is often advisable, to shorten or take out part of a branch, where the pruning of the whole at once would too much diminish its leaves, and risk the throwing out of useless and mischievous new side-shoots; which always arise, either from excessive pruning at once, or from some disease or defect in the leader or higher branches of the Plant.

At the time of *Planting out*, similar attention should be paid, to the close taking off some of such side-branches as most nearly rival the leader in strength, and rarely any others; and the subsequent attention for some years to Plants, previously well trained in the Nursery, will be too like that already described, to need repeating; a sharp Pen-knife held in the Fingers, and acting against the Thumb of the same Hand presented in a proper position to support the Plant, and meet its resistance, being all the apparatus which such

Plants

Plants call for, in training them. It may be proper to recommend the Pruner of young Trees, always to place himself on the opposite side of the Plant to the branch that is to be amputated, and to reach over the Plant while performing the operation; effecting the cut by the exertion of the Fingers, and by no means by the swing of the Arm.

In examining *Plantations*, that have been made four or five years or more, particularly in exposed situations or on poor soils, and which have been neglected, it will often be seen, that the Plants, Silver Firs in particular, that had made vigorous main and side shoots in the Nursery, have for two or three years afterwards made very slow progress, their annual tiers of branches being very near to each other, and so entirely besetting the small leader, that its further progress will seem doubtful, and even sometimes the leader will be found dead, while the long lowest tiers of neglected boughs are seen in full vigour: and not unfrequently it will also be seen, that this melancholy reverse in the growth and progress of the Plants, has happened after they had grown vigorously in the Plantation, perhaps while their roots were confined to loosened or better soil, in the holes in which the Plants stand, or owing to extraordinary seasons of frosts, droughts, &c.: here the skill and care of the Pruner is particularly necessary, in carefully taking out a portion of the stunted branches in the last formed tiers, where they too closely beset the diminutive leader, if alive, and then taking close off, as many, as my rule as to foliage will allow, of the strongest branches in the lower tiers; and until such a state of the Plants is entirely removed (which will be found the more difficult to accomplish the wider the Plants

Plants stand apart*) careful annual pruning on these principles, ought not to be neglected.

In examining deciduous Trees under these circumstances, Oaks in particular, it will very frequently be found, that the leaders have perished, and new ones have been selected or preferred by Nature, among the side-shoots near their tops; and in all such cases it will be found, that the old leader, tho' not thicker than a straw, perhaps, and nearly rotten, is entirely forcing the new leader from its straight course, and too often a dead knot of a serious kind is also preparing, by means of this extinct leader: not uncommonly, in examining young Plantations, two or three successive impediments of this kind to the straightness and health of the Stem will be found on the same Plant; and by which, the vigour of the lower boughs have in a more than ordinary degree been promoted, and those of the upper as much checked. In all cases, the entire removal of dead or dying leaders, is of the first importance, and which is best performed with the point of the Pen-knife, as before observed, cutting in a sloping position, so as best to suit the curvature or inclination of the new leader, and carefully and slightly wounding the live bark all round, that the enclosing of the old leader may the sooner be accomplished. Besides, of leaders actually dead and others ready selected, it will often be found, that two branches, of a deciduous Plant in particular, are contending for the leadership; or the leader is in a very sickly or damaged state, and

* Because, in such Plantations, air and light are more than sufficiently supplied to the lowest branches, and the leaders and upper ones are more exposed to the chilling blasts, for want of shelter, than they ought to be.

one or more shoots near the top appear more vigorous: in all such cases, the Pruner should not hesitate longer, than to ascertain, which among the upper shoots is most healthy and vigorous; in order to select that as the leader, and then proceed to cut off all above or branching from him, close and in a sloping direction, as before described; being assured, that as soon as the bark is healed over the place of the exterminated leader or rival (but never before, as we see in the small dead leaders above-mentioned, and in forks), the Stem will begin to grow straighter, and at length the defect will entirely disappear, and a straight and clear Trunk succeed*.

A proper *Pruning-knife* will have become necessary, in some of the operations above-mentioned, which should be kept very sharp, particularly at the point, and in the use of which, it is much the best way, as already mentioned, to lean over the Plant, from the opposite side of it to that on which the branch to be pruned grows, and to take hold of such branch within two or three inches of the Stem, in the left hand, and

* Some I know contend, that no straightening of the pith ever takes place in such cases, but merely, that more new Wood is applied in the hollow than on the round side, until apparent straightness ensues; and that in cleaving such pruned Trees for Lath or Pales, the defect is very observable: I neither, however, admit the fact or the reasoning, as applied to deter this practice of selecting *the most healthy* leader, after having repeatedly seen such crooks become straight, or near it, as could not be included *within* the bole of the largest Tree: and because, if a considerable deviation of the pith from the centre of the Tree, might in such cases be perceived (which I doubt), the products of the Sawyer are much more numerous and important than those of the render of Laths, Pales, Spokes, or Staves; aware as I fully am, that in the present neglected and knotty state of our Timber, *clear* Oak buts, for these uses, fetch by far the best prices.

to

to apply a moderate force thereto upwards; or from the Knife, while the same is applied with the other Hand, in a lifting and drawing stroke, which will in this manner clean sever branches, even as large as the Thumb or larger, with an ease, that will appear very surprising and pleasing to a young Pruner: the advantages of this mode, of taking off branches that originate lower than breast-high of the Pruner, are so great, that in operating upon higher boughs with the Knife (unless very small), both expedition, ease, and perfection of the work will be consulted, by the use of a light and strong pair of *Steps*, such as are in common use in most Houses, on to which the Pruner should mount, as high as is necessary to command the bough to be pruned, in the manner already described. Larger boughs, and those of hard woods, will also occur, for which a *Saw* should be at hand, in these first prunings of neglected young Plantations*, and this should be, what

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* At the time the above was written, I had no personal knowledge of the successful use of other Instruments, besides the *Knife* and the *Saw*, in pruning young Forest Trees (having never seen the Drawing-knife in use, as recommended, p. 279): since then I have been particular, in a Journey thro' Wales and Scotland, to enquire as to the progress that Forest Pruning was making; and having learnt, that in the latter Kingdom it was little if at all practised (tho' so excessively wanted in their Fir Plantations), except on the Estates of William Moore, Esq. of Coldwell, at the northern extremity of Ayrshire, and on those of Lord Francis Gray of Kinfauns, near Perth, and that in these places the *Pruning-chisel* had superseded the Saw, I was, therefore, anxious to see the operations thus performed, at Lord Gray's, and on being introduced to Mr. *William Campbell*, his Lordship's Gardener, I found, that when resident formerly at Mr. Moore's, he had at first used a fine-toothed Saw for pruning his Plantations and Woods, but had discovered on trial, that a strong and very sharp Chisel of a proper construction, driven by the swing of a Mell or Beetle, was much more expeditious, and

what is called a Tenant Saw, of the smaller sort, such as every Joiner has in use; and as the ease and perfection of the work, a good deal depends on this being sharp and

and equally or more neat and efficacious, in pruning young Trees, to the height of 14 or 16 feet at the least, he had since adhered to the Chisel. After walking with me thro' the different Plantations and Groves of young Trees that he had pruned within the last two or three years, near to Kinfauns House, in a very perfect manner, he proceeded to show me the operation, first in the most simple and easy cases, and at length in the most difficult cases that I could fix on, of very hard and thick snags of Fir-trees, of rather large branches that grew on nearly inaccessible sides of the Trees, and on such as were situated on steep ground, &c. &c. in all of which he succeeded so perfectly, in quickly, closely, and smoothly, severing the branches from the trunk, that the Pruning-chisel certainly appeared in this Gentleman's hands, a most valuable and effective instrument, the use of which not having yet been described by any Writer on Pruning, as far as I know, I am induced to give here the substance of my Notes made on the spot, on the 26th of September last (1812).

The *Chisels* used by Mr. Campbell are now kept for sale by Messrs. Dixon and Brown, Nurserymen in Perth: they are three inches and a half broad in the blade or cutting-edge, and not more than seven or eight inches long, including the hollow socket to receive the handle; the flat or chisel part, does not exceed two inches and a half in length, and is about three-eighths of an inch thick near to the socket, and the whole weighs about a pound and a quarter; the blade is stoutly bevilled, only on one side, and the cutting-edge is carefully made to coincide with, or cross the axis of the socket, and of its wooden handle. These *Handles* are made of straight, clear, or knotless pieces of foreign deal, five to twelve feet long, and cylindrical, except where they enter the sockets of the Chisels; which socket, one inch and a half diameter inside at its mouth, the remainder of the handle being two inches diameter, or as large as a Man can well grasp in his hand: the lower end of the handle is sometimes hooped, but it is better to have a ferril, or cylindrical socket of iron for it, nearly the size of the wood on the oustide.

The *Mells*, or Wooden Mallets or Beetles, are made of hard Oak or Beech, not too clear in the grain, ten inches long in the head and six inches diameter, with handles two feet eight inches or three feet long: sometimes the Mell is hooped at each end, but with tough twisted wood and

and in good order, it is the best way to have two at least of such Saws, and on leaving off pruning at night, to

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and careful use, this has been dispensed with, and the labour of carrying and swinging it is somewhat reduced.

In the experiments which I saw, Mr. Campbell himself held the Chisel, grasping its handle fast in both hands, that it might not dindle or jar. In favourable situations, the edge of the Chisel, with its bevil downwards, was placed directly under and inclining towards the branch; but where there appeared danger of cutting the stem beyond, the ground did not suit to stand, or the branch grew askew from the stem, in these cases, the Chisel's edge was applied obliquely upwards, (as it was also, even to horizontal, with very low branches) with the arras or cutting edge turned towards the Tree, care being taken in all cases, to present its edge as near as possible in the plane of the intended cut.

The Chisel being thus carefully placed and held, so as to present the lower end and about a foot in length of the handle next it, in the most favourable position for the assistant, called the Cawer or *Driver*, who used his Mell with an over-hip, or under-hand swinging stroke, being very careful to strike fair and exactly in the direction of the handle and cut, and with the requisite degree of force, according to the size and hardness of the branch to be severed, &c.; but sometimes for horizontal branches, he strikes forwards and upwards with his Mell. The dexterity, safety, and certainty, with which these apparently difficult and dangerous operations were combined by Mr. C. and his practised assistants, much surprised me, and gave much appearance of probability to his assertions, that while a Saw-pruner was placing his Ladder and mounting to a branch between six and sixteen feet high, that he would most effectually sever it, by the Chisel and Mell.

The Kinfauns' Plantations and Woods having been previously much neglected, branches sometimes wanted amputating from the trunks of young and thriving Trees, which exceeded the width of the Chisel in diameter; in these cases, Mr. C. sets in the mouth or edge of the Chisel on one side of the lower part of the branch, so that in driving it through, the corner of the Chisel may come fairly out to sever the Bark, and not leave it to be torn, and then places the Chisel anew to complete the severing of the branch, being careful, in case the width of the Chisel won't completely effect the cut at the second operation (so that no Bark is torn) to take previously a narrow middle cut, to bring the remaining wood within the breadth of the Chisel: and I was pleased to see in these opera-

to return them into the care of some working Joiner or Carpenter near the spot, to clean and properly sharpen and set them (not too rank or wide), which he would be glad to do in his Evenings, for a moderate compensation, as well as to preserve them at all times ready for use. In the subsequent operations, in pruning higher boughs, when the Saw is alone used, and in large establishments wherein several stout Boys, each furnished with a Saw and a light *Ladder*, are employed, under the constant inspection of a careful and steady Director: it will be found important, that such a Director should

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operations, how well large and heavy branches supported themselves without any holding, until the Chisel was ultimately driven quite through, and that then they bounded off from the Tree, so as little to endanger the men by their fall; and with care in this respect, no accident of the least consequence had happened to Mr. C. or his men in several years practice.

As it sometimes happens, that the different cuts of the Chisel are not made in the same, or not in the proper planes, in such cases, Mr. C. afterwards pares or smooths them, by using the cutting-edge of the Chisel downwards or towards the Tree, and by very slight strokes of the Mell; the cut is thus, often, more properly left with a *curving surface*, than *in one plane* surface, as a Saw must unavoidably leave it.

Mr. Campbell says, that with longer handled Chisels he could prosecute the pruning or clearing of the stems, higher than is mentioned above, equally well and more expeditiously than with the Saw, but which Instrument he still highly values, for pruning the higher parts of Trees. The advantages and limits of the uses of the *Chisel* compared with the *Saw*, in pruning, seem to me, from the above observations, to be highly worthy of comparative and more decisive experiments, to be made under the superintendance of a Committee from the Highland Society, or the Board of Agriculture, and that handsome Premiums to the most effective and economic Pruners, of sufficient extents of Plantations, under different circumstances, might go farther to remove the present lamentable and disgraceful state of neglect and ruin, in which the Woodlands of Scotland seem almost universally found, than any other step that could be taken.

be expert at sharpening Saws, and should have a portable apparatus for the purpose, which he might occasionally set up, as nearly in the center between the Trees that the Boys are pruning, as he can, and while whetting their Saws, might still have a sufficient eye on their proceedings, at least after they have become expert: a pretty long and straight Stick will be useful in the hand of the Director, to point occasionally to the Boughs to be pruned, and to the exact place of the intended cut, or to any defect or amendment wanting, in those already made; and with careful and good Boys, the motions of the Director's Stick will be understood immediately, in most cases, without much being said, which it is always desirable to avoid, where several are employed; and if to the qualities of the Director's Stick above enumerated, a little pliability and toughness be superadded, and sound discretion be at all times exercised in the uses of it, much good will result from the attention of the Boys being kept to their business by it: and experience has shown, that well-disposed Boys under such a system, are much better Pruners, in the advanced states of it at least, and when somewhat of order has succeeded, to the almost infinite disorder in a neglected Plantation, than more clumsy, obstinate, and expensive adults. Women, whom it is often very desirable to employ in field business, might be trained to all the Pruning operations on the Ground, and even on the Steps, with great advantage: one thing, however, is most important for the Proprietor to insist on and enforce, that his Director of Boys or Women, should carefully look round all the Trees, as soon as their Pruner has left them, to recal them to any necessary pruning omitted, to cutting closer, or to admonish for any thing done wrong or in excess:

not being tardy in his commendations, of what he finds well done; to which the inducement of liberal wages, in an increasing scale, according to the care, industry, and expertness displayed, will be a proper and necessary addition: and, perhaps, if the Director of Boys had in his pocket a number of small Cards or Tokens, and on seeing reason to commend any particular instance of their pruning, should immediately, and in presence of all the others (but not elsewhere), deliver one of such Cards, to be produced at the end of the week to the Proprietor or his Agent, in claim of a small Gratuity; or, if a higher class of wages might be the result of a certain number of such Tokens, it might have a very beneficial and lasting effect.

With respect to the proper place and direction of the Pruner's *cut*, it is to be observed, that the object always is, to leave a ring of live and healthy bark, fresh and cleanly severed, surrounding as small and as smooth a plane of wood or knot, and as close to the trunk, as is practicable, in order that the same may as soon as possible be covered by the approach and meeting of the bark of the trunk *from all sides*: but which will be effectually prevented on one side, in most instances, where a Bill or *chopping instrument* is used, tho' ever so expertly wielded, or with a Knife in too many instances, when used to cut *from* the Operator, instead of towards him, or by the swinging momentum of his Arm, in any direction, by a *lip*, or thin projecting edge of the knot, that did not stand firm against the cut, remaining, unless, indeed, the same was made closer and larger than necessary, and also endangered the wounding of other parts of the bark, by the swing of the tool: which *lips* were among the greatest evils of the casual and random prunings of the Woodman and Planter, prior

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to Mr. Pontey's Work, and in too many instances since; such being exceeded only, in mischievousness, by *broken* branches, which, to a longer projecting lip or edge, add in general, their being split and raggedly torn*, in the worst possible forms for the approach, and even close contact, of the new bark over them.

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* Of which blemishes, unfortunately, Mr. Robert Salmon was able to select ample and numerous specimens, from the Woburn Plantations, to communicate to the Society of Arts (see their Transactions, Vol. XXIV. p. 70, where some of such are drawn and described), owing to the mistaken humanity, which had, for an age almost, admitted the *Poor* into those Fir Plantations, to break and do almost as they pleased, without cutting tools; and where it could not be alledged, that they were not treated with a sufficiency of that *confidence*, to which Mr. Pontey has alluded in a Note (that I regret much to see, in so able and useful a Work), p. 140, to advocate the letting of Cottagers into Woods and Plantations, even after he had seen, that the greater part of the ragged, ruinous, and disgraceful *snags*, that he had been called in to remove, from the Fir-trees at or near Woburn, had been so occasioned: for my own part, I should as soon think of recommending Gentlemen to grant free quarters in their Larders and Kitchens, for the Poor, as to let them into their Woods or Plantations on any pretext, even those of *Rotten-wood* or *Nutting*, were it in their power (as it certainly is) to prevent both. It is the *duty* of Gentlemen to themselves, their Families, and the Public, according to Mr. P.'s own incontestible principles, to *prevent* the occurrence or continuance of *rotten boughs*, by timely pruning, or the Axe of the Timber Faller, and therefore, why introduce so dangerous a palliative?—a remedy it surely was not his intention to consider it. With zeal, of a character that some, I fear, will mistake and others condemn, more loudly, perhaps, than I have done the opposite one above, I cannot avoid protesting against all free-booting practices, or allowances, or claims, of any such (tho' it were even to make us appear "human") in a country where, for centuries, every species, and every part of Property, has been *fully and personally appropriated* to somebody: especially, when an undefined portion of all that property has been assigned, and is guaranteed by the Government, to answer the most *indefinite wants of all the Poor*: in England, therefore, Wood-gathering, Gleaning, and all simi-



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It not unfrequently happens, with young Trees, Larch in particular, that there is a swelling or larger part at the shoulder, or springing of the side-branches from the stem; in taking off such, it will not be advisable to cut quite close to the stem, on account of the increased size of the wound in its bark, that would thereby be made, nor is it often proper to cut quite beyond the swelling, but rather to take off a small part of the swelling, with the branch. In selecting the largest boughs to be first pruned, it will often be right, to have regard to the thickness or size of their insertion into, or springing from the trunk, as well as to the quantity of their twigs and foliage, especially if they appear to be thickening next the Stem, as an unnecessary size of wound in the bark will be sometimes avoided, by taking off such, even in preference to larger boughs in other respects.

A very common error with Pruners has been, to devote their whole attention to *clearing up the Stem*, rather than to promoting the general health and the increase of the height of the Tree, by annually or bienially relieving it, from such large and luxuriant side-branches as aspire to a rivalry with the leader (subject always, in the performance, to a taking away of not more than one-fourth of its leaves at once), relieving it from the largest of the boughs (tho' they may be smaller than some others) found in every clustered place, or where the stem is nearly *beset with them*, in deciduous, or leaf-shedding Trees, in particular. For when the side-

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lar practices, ought to be unanimously prohibited, in common with public Begging, Gipsey-roving, &c. and disappear, as perfectly unnecessary, highly mischievous to the minds and principles of the individuals who practise them, and inconsistent with their state and condition.

branches

branches are reduced by these attentions, to such only as are very subordinate in size and vigour (except some, perhaps, near the top) to the main stem or trunk, and are all of them so disposed, as to their distances, and proceeding pretty nearly at right angles from the trunk, that clear strips of bark, on the different sides of the trunk, can be readily traced from the ground upwards to near its top*; there is then no necessity to be in haste, for clearing the lower part of the stem of its small living branches, because the knots of such will be small, and will be confined to a very small distance from the pith, when the Tree has arrived at maturity; and these small laterals are an excellent reserve against accident or blight, happening to the leader or upper branches, or the necessity occurring, of extraordinary

* An attentive observer, walking into most Plantations, will be able to select a few examples, casually produced, among the Larch in particular, that will gratify the eye with all these perfections in a growing Tree: and the Owners and Managers of Plantations would do well, as I have done, often to study these models attentively, that they may so conduct their pruning operations, as *to assist but not counteract Nature.* The circumstance above-mentioned, of the *Larch* oftener assuming, spontaneously, a proper shape and habit for producing Timber, than any other of our Trees, has fitted it, the best, *to bear the neglect* of Man in its culture, as to producing plenty of *straight* Timber, whence a part of its celebrity has arisen; but as tho' the all-wise Contriver of the Universe, had determined to show, in this, as in all other things, that Man is to depend, in a principal degree, on the exercise of his mental and bodily faculties, for all the good that he possesses: *clean* Timber, is least of all to be expected from the neglected Larch, from the almost incorruptible nature of its smallest side-branches (as Mr. Pontey ably shows); which, tho' they be smothered by the vicinity of other Trees, and die, they won't rot and fall off, so that the bark and clear wood might grow over their places; and I think it even observable, that the more trees are disposed to a right shape and proportion of their laterals, the less are those laterals disposed to die and decay.

x 3 pruning

pruning there (where the chief vigour ought always to lie), as a vent for the sap while the injury is repairing, and by their leaves to assist, in carrying on the functions of the Tree in such cases: in many situations their shelter, and contributing to the mass, will also be very beneficial, on the outsides or skirts of Plantations in particular: and in some, where ornament and shelter are primary considerations, as on the outsides of particular Plantations, and in narrow belts and screens, Gentlemen may perhaps be disposed (having laid the foundation for tall and straight Timber, free from *large knots*, as above directed) to suspend their operations, and sacrifice entire clearness, or submit to small knots throughout their Timber, in order to obtain appearance and shelter, during its growth; very frequent and careful attention will, however, in such cases be necessary, to close prune all branches that obtain an undue share of vigour and size, especially if they rival that of the trunk, and for removing all those branches that die.

In the interior and more sheltered parts of Plantations, the entire clearing of the stem from twigs, however small, ought to proceed, as fast as attention to the other more essential and pressing objects, explained above, will admit; and I hope, that nothing which I have said herein, will operate, to cause this important object, and ultimate aim of Forest Pruning, to be any longer delayed than they do require, in all such situations: It appears to me only a false and vitiated *taste*, that requires the hiding of the bodies of Trees, from those who enter within a Plantation or Wood, even near it ridings or walks, since those who cannot mentally combine the *useful* with the beautiful in such (and indeed in all other cases), ought to confine their excur-

excursions to the Parterre, the Pleasure-ground, or Shrubbery, or at most to the Fields and Roads; and not require the seclusion, much less the prevention, of what they have not discernment enough to admire, viz. fine, tall, straight and clear trunks of Trees, surmounted with open and well disposed and shaped, but not over large heads, in the full luxuriance of foliation: these being to me, and to many whose opinions I the most reverence, among the most beautiful and gratifying objects in the inanimate creation.

But it is time that I close this subject, and leave its enforcement to the more able pens of Mr. Pontey and others, after mentioning, that the winter season is *the time* in which pruning on a large scale must principally be performed, and which may safely be carried on, between September and April: the taking off dead leaders, and others of the smaller operations in the training of young trees, and where no considerable numbers of cut surfaces are exposed, may without risk be performed at any time, by careful and skilful persons; and thus the Director, and most skilful persons employed, in large establishments, may be constantly kept at work with advantage, in the Nursery, or in looking over the young Plantations.

The *thinning* of Plantations, or regulating the distances of the Plants, according to the growth and nature of the Trees, the exposure, and other circumstances, though far more attended to in the past age, in this and other Counties, than pruning, except in particular instances, and those mostly of Oak, that have fallen under my observation, is confessed by Mr. Pontey, to be a far more difficult part of wood management, than any other, and one on which the same simple principles and short practical rules cannot be

laid down: nevertheless, the importance of its being properly conducted, and not neglected, is so great, in all points of view, that Owners of Plantations, or their Agents, ought to make it their particular study, or if deterred by the difficulty and complication of the considerations which it involves, they should once, if not periodically, take the opinion, and have a report from some professional man* like Mr. Pontey, to assist them in the conducting this part of their Plantation business, which they will rarely find it safe to confide wholly, to the local persons fully capable of most other points of its management.

That Plantations are much oftener made *too thin* than too thick, in the first instance, may safely I think be affirmed, with the slight degrees of attention that have usually been paid to thinning and pruning them; but when these are intended to be constantly and systematically pursued, no doubt but thick planting, as two and three to four feet distances, must answer best, when it is considered, that Fencing, Rent, Taxes, Tithes (if by composition) and Superintendance, indeed all but Plants and Planting, are the same for half as for a double crop, on the same extent of ground: and that

* The Author's professional practice in *Mineral Surveying*, has led him to pay much attention to the growth of different sorts of Trees on particular soils and *Strata*, which he has been called in to investigate beneath, and in particular situations of moisture from springs, drought, exposure, &c.: a species of knowledge, which if applied at or prior to the commencement of Plantations, would be found eminently serviceable; and the same is scarcely less useful, in conjunction with the true principles of pruning and rearing individual Trees, in determining on the *times and degrees* of thinning them, and whether a present or future appropriation of the crop, on lands already planted, ought to be made: to which objects, his Reports on Estates are sometimes directed, when so desired by his employers.

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the Plants will for a certain time, without any care, and for a longer one with proper pruning, grow no worse, but often much better, for being thus thick, in almost all situations, but particularly in exposed ones, no one can deny; there can also be no room to doubt, but the supernumerary or *Nurse* Trees, instead of being soon cut down for Faggot or Brush-wood (which in the Coal Districts are often of trifling or no value) to prevent their boughs injuring or choaking the better Trees, or those intended to remain, which too often they do, through neglect, might all, by proper pruning, stand until they were much more valuable as small Poles; and by which procedure, a better opportunity would be given, for selecting the Trees (when wholly or principally of one or a few sorts) of the most favourable form and growth, and standing at more proper distances, than when the permanent Trees and Nurses are more determined on at the time of planting.

It has appeared to me also, that the *biggest Trees* are generally left in thinning, when often, the smaller, or second rate ones are better grown, less tapering, more uniform in size, and would ultimately make more profitable Timber, and bear to stand nearer together without injury to each other, than those which happened to take the lead at first, while these, being brought thus early to market as pruned Poles*, would materially diminish the first cost, and accumulating compound interest upon it, which ought in every case to be calculated, against the value of the growing

* Where a permanent Wood is intended, and these larger and first selected Trees to be chopped down, are of the sorts adapted to Underwood, the progress of such Underwood would be much facilitated, before the other Trees had too much advanced in height, and in branching over these young stools.

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crop, in every Plantation (see p. 225 and 239). In a very few years a second thinning of Poles, much more valuable than the first, would follow, and again in some few years more; but the rate, the progress, or the time of these, it is impossible to treat fully of in this place, for the reasons above given.

Gradual thinning, and not excessive at any one time, may however be safely taken as general rules: and in calculating the progress of Plantations, or instituting calculations for ascertaining the propriety and times of further thinnings, particularly of Fir Plantations, the Calculator should be careful, to take in the Trees *of all sizes*, on an acre, or some given space sufficiently large, or he may be greatly deceived, by inferring *numbers* of Trees from a few nearest distances apart, or the total *measure and value* of Plantations by selecting Trees of a *mean* size, content or value, than which nothing is more difficult, or liable to deceive than the eye is in such case, except after several actual and careful experiments, in Plantations similarly circumstanced as hinted already, p. 240.

Fir Plantations, where no Underwood or succession crop can be growing, after proper pruning and training, would require to stand much thicker than has been supposed, or recommended by several persons, for producing the greatest ultimate profit to the owner of the soil, both to avoid having any vacant or unoccupied parts of his ground, however small individually, and because Fir Timber grown in such circumstances, is harder, and approaches nearer to the valuable sorts of foreign deal, the best of which is grown in remarkable *thick and close* Woods: the thinning therefore of Fir Plantations must sooner and more entirely cease, than with mixed and deciduous Plantations, where profitable

succes-

successions will spring up, among the comparatively few Trees, that are ultimately to remain for Timber of full size. And after a certain state of thinness in Fir Groves is arrived at, by successive thinnings, this process should stop, until the result of mature consideration and well-grounded calculations, show the proper times of bringing the entire crop to market, in portions of the surface at once: and then immediately planting again, in too uneven or rough situations to admit of cultivation following, which otherwise would be the most advisable course, probably, for the owner and the country also, as hinted page 268.

## SECT IV.—TIMBER.

The increasing *scarcity of large Oak Timber* for naval purposes, has been the subject of many and grave discussions of late years; from all which it most evidently follows, I think, that the two principal causes of the evil are, the almost general delapidation*, neglect, and mismanagement of the *public Wood-lands*, and the decrease of large Timber on private lands, particularly since the extension of Canals facilitated its carriage to market, owing, to an almost general discovery by the Proprietors of such, that young Timber pays vastly better to the grower than large, as observed page 221 and 227; and to which the remedies seem apparent, viz. first, reform the entire system of perquisites and of common rights, and other abuses, and in-

* Or dearboration rather, as I have hinted in some particular instances in the first volume, p. 381.

consist-

consistent claims on the public Wood-lands; and entirely separate and fence, plant, prune, thin, and manage on the best principles, all the lands of this description, which remain to the Crown; and second, to offer such *prices* for large Timber in future, as shall show it to be *the interest* of individuals, to reserve and protect their Oaks now standing, and to enter confidently on the planting and training of numerous others, for centuries that are yet to come: as I have hinted already, page 227.

Some legislative provision may be applied, perhaps, to the Hereditary and Church Lands, with good effect, to this end, by enabling persons in possession, who under proper circumstances, and the national guarantee, reserve, or even plant and train Oaks for Naval Timber, to raise or draw a part, of the great profits that will accrue to the Possessor of the Estate, when such Timber shall arrive at maturity, and be cut and purchased for the Royal Navy, and out of the produce of which future sales, these mortgages or advances should be first discharged or repaid. In the mean time, the making of *Canals* and better contrived *Turnpike roads*, into all the districts of the kingdom, would greatly facilitate the removal of such Timber, and should on this, as well as on every other consideration, experience the fostering care and assistance of Government, in discountenancing the vexations and undue privileges claimed, in favour of large Parks, and of Mill Streams of water (for Canals), beyond that of Land itself, in opposition to the taking parts of them, on equitable terms, for these important and public purposes; the retrenching of all unnecessary fees and expenses in obtaining Parliamentary Acts for such purposes, and imposing therein

therein no claims of exemption from Tolls in favour of Government.

Another most important object to the increase of Navy Timber would be, the removal of the false pride and mistaken notions, that occasion the Great to think, too commonly, that a large quantity of old and *spoiling Timber* is conducive to the grandeur of their parks and domains: as if a dozen or twenty very old and venerable Oaks, which I admit to be among the most interesting and indubitable marks of hereditary greatness in the owners (and should be preserved with religious care), were not, when properly displayed, and set off by surrounding scenery of an opposite character, as effectual or more so to this end, than five times as many acres of Trees, which disgust by the inutility and uniformity of their character, and exhibit rather the folly, neglect, and want of public spirit in the owner, than any thing else. I am aware, that vulgar prejudices run high in favour of these things, and that the axe of the Timber-faller is no sooner heard in a great man's Park or Domain, than the head and tongue of every idle gossip is set to work, to invent and propagate stories of Gaming-Tables, Contested-Elections, Crim. Cons., Extravagant Mistresses, &c. &c., to account for that appropriation of property, for which policy, reason, and the wants of the State, so imperiously call.

Perhaps the only remedy for this important impediment to the supply of the Navy with Timber now ripe, and the making way for other Trees that would have the best chance of following them hereafter, would be, for some of the able and illustrious individuals in this Class, whose characters and motives are above suspicion on the grounds alluded to, to cause

surveys

surveys and classifications of the Timber on their Estates to be made, as to what is now, and will at succeeding periods, be ripe for naval purposes, and to present an abstract and an offer of the same to Government, for the public service, on terms fully adequate, according as times and circumstances favoured the falling of it: and if this was followed up, by the proper details and arguments, addressed to other Park Owners and the Public, showing the reasonableness and great advantages of such a system of proceeding with respect to Park Timber, much might be accomplished.

A more public and perfect understanding, as to the modes of getting Timber *admitted into the Dock-yards*, the modes and proportions of Measuring, Prices, Expenses of Carriage, &c. &c. seem also much wanted, in order that Gentlemen may not be forced, as at present is nearly the case, to sell their Timber destined for the Navy, to strangers, who come to bargain for it standing, by modes of measurement, and computations, and allowances, but little, if at all, understood by their resident Agents, in many parts of England; and thro' which, they are often most grossly imposed upon; and the subsequent conduct of the Timber Contractors in such cases, in lavishing what they have so easily come by, for the sake of *ready money*, impresses the vulgar of the neighbourhood, and even some better-informed persons in a wider circle, with ideas, of great improvidence, distress, and folly, having led to such a state of things*.

Owing

* I knew a Nobleman some years ago, whom motives, partly of a private, and partly of a public nature, induced to intend the Timber on 20 acres of his Park, for a Royal Dock-yard, and directed his principal Law

Owing to the very intricate and almost unknown relation that subsists, between the *quantity* or content of a Tree, or lot of Timber, as such is invariably measured standing, and lieing while round, in all the Woods and parts of England, by what is called *round* or girt measure, and the measure called *square* or caliper measure, by which it is contracted for and taken into the public Dock-yards, and into most private Ship-

Law Agent in London, to take steps for the sale of it: he recommended some famous Timber Valuer from a distant county to be employed, and who took with him to the spot, a still more noted Navy Timber Contractor, or Dealer: between these, the business was snugly managed, under the eye of the Nobleman himself, and who was induced (from the representations made to him) to think and speak, of the *wonderful prices* he had made of his Timber; his resident Agent, however, who had been thought by the Auditor, too inexperienced to be at all consulted on the business, saw some reasons to suspect that all was not right, and he was industrious during the falling of the Timber, to measure it correctly each evening, before witnesses, after the Contractor's men had left work, and to obtain information of the different sales of Bark and Fire-wood, and of all the expenses on the spot, which he was enabled to do from people of the neighbourhood being employed, except an overlooker or two, sent by the Timber Dealer; and the result was, that after deducting from the prime cost agreed on, the net and almost immediate sums received for Bark and Tops, the whole lot of Timber stood the buyer in something less than *sixpence per foot*, or less than the low price of Billet-wood there at the time! but as the Agent expected, this did not prove the worst of this case, for instead of the Timber being all or nearly so, *taken away* for the Navy, as was expected, as above mentioned, by far the greater part of it was afterwards *retailed* in the neighbourhood, at second and third, &c. hands, and every carpenter, wheeler, and purchaser at the Lord's regular and annual sales, from his extensive Spring Woods, were supplied with several years consumption, of better Timber than they had been used to buy, at *less than half* the former prices, tho' Timber was then rapidly advancing! The Timber therefore that his Agent had to sell, was for several years depreciated in price, and great part of it remained unsold; and the consequence was, that this Nobleman declared, and unfortunately has kept his word, that he would never sell another Tree standing, as long as he lived.

yards,

yards, &c.* and both of which differ so variably and materially, from the true *cubic* or solid measure, in use in all Deal-yards, Carpenters' Shops, &c. that there are very few Timber Owners, or their resident Agents, acquainted or nearly so, with what the produce *in Measure* of their Timber would be, when delivered into a Dock-yard: it has, therefore, been of little use to such (except to deceive), that Government have occasionally made known the *contract prices* of Oak Timber in the Dock-yards; as it has been in the power of the private or intermediate Contractors, or other interested persons, to pass off whatever assertions they pleased on the Timber Owner: but who sooner or later discovering, that his prime Timber thus applied, produced so notoriously less than it ought, or than his smaller and much inferior Timber actually did, in some instances, as sometimes to raise the laugh of the least observing against him, among his Agents and Neighbours; the consequence has been, that he has either determined to let his Timber stand, or to use it for his own purposes of Building, Fencing, &c. instead of paying *high duties on Foreign Deal* (which are among the most operative causes of the scarcity of Navy Oak), and to sell any surplus he may have of large Timber, to the neighbouring Coopers, Cabinet-makers, &c. who have been always ready to give much more for Buts, that suited their particular purposes, than Navy Contractors would

* Several years ago, I explained the Mathematical Theory, and gave a Table, and easy directions, for ascertaining the quantity and value in either of these measures, from having the quantity, price, and necessary particulars given (as the *degree of hewing* squared Timber) in the other, in Mr. Alexander Tilloch's Philosophical Magazine, No. 75, Vol. XIX. p. 213; a subject which no Mathematical or other Author has touched upon, that I have read or heard of.

give

give for the whole Trees, when such were cross-cut, and while the large tops thus left, were almost as serviceable in the common building purposes of the Owner as clearer Timber.

About an hundred of the finest Oaks that I heard of being fell in Derbyshire, while on my Survey, were thus appropriated to the Cooper and the Cabinet-maker, instead of the Royal Navy, as I was told, from the Park of Lord Scarsdale at Kedleston, in 1805: the account which Mr. William Clarke, his Lordship's Woodman, gave of the measure and value, or sale prices, of one of these very fine Trees, was as follows, viz.

| | £ | s. | d. |
|---|---|---|---|
| 550 feet of Timber, at 5*s*. 6*d*. per foot, (round measure) | £151 | 5 | 0 |
| 9 Tons of Bark, at 4*l*. | 36 | 0 | 0 |
| Arms and Brushwood, | 14 | 0 | 0 |
| Roots, | 2 | 12 | 6 |
| Total, | £203 | 17 | 6 |

It was stated at the same time, that among many other very fine Oaks standing in the same Park, there was one so large and fine, that it was estimated to be worth more than the above by fifty pounds or more!

In order, therefore, to second the endeavours of those disposed to give the preference to the Royal Navy, in the sale of their large Oaks, on terms full as good at least as they can make elsewhere (and who should expect them to take less?), would it not be advisable, for Government, on receiving offers of lots of Park Timber, as above, to send down some clever, honest, and steady Person, previously well acquainted with the modes of measuring, inspecting, and receiving Timber,

into the Dock-yards, and how far different sizes or shapes of Trees, or slight defects (as small dead or rotten Knots, Shakes, Cups, foxey Butts, &c.), would exclude or affect the value per Load? all which he should explain to the Timber-owner or his resident Agent, without reserve or deception, in any point: and that such Person should stay on the spot during the fall, to point out the necessary precautions in falling, to avoid breaking or splitting valuable Crooks or Knees; to measure all that is fell, first by the girt or usual method; to point out any Trees, or parts of them, which when down may appear improper for Navy purposes, and to mark off all the Trees and large Arms in the proper places for cross-cutting: it might also be desirable, that experienced Hewers and Sawyers should be ready, who should proceed with the hewing and sawing (at the Owner's cost, and without any perquisites, but under this Person's direction) as fast as the Trees were felled, peeled, and cross-cut, according to the best and fairest methods of performing these operations, between the Buyer and the Seller: he should immediately measure all Trees and Knees as they were hewn, according to the caliper method, and Plank according to the solid or plank measure, and render copies, and fully explain all these accounts, to the Timber-owner or his Agent: he should further be ready, by his knowledge of Timber Carriers, and their prices, &c. to assist in the conveyance of such hewn Trees, Plank, and Knees, to the Dock-yard intended, and in getting it there passed, on arrival, without prejudice, favour, or delay. Such person to be paid for his time and expenses by Government; to claim or accept no Fees or Perquisites whatever from the owners or others, and to have nothing whatever to do with purchasing the

the Timber, or buying or selling any Tops, Bark, Chips, or Offal therefrom, but all these to go thro' the ordinary channels of the Timber-owner's business, or that of his Agents. By these means, that mutual knowledge and confidence might be formed, or restored, I think, between the grower of Timber and the consumer, which is necessary, for removing a very principal bar to the supply of the Navy from private sources, in the inland districts in particular, and for preventing the perversion of this invaluable article, to less important purposes. By way of a proper bounty to the possessors of large Timber who adopted this plan, it would be right to make no deduction for the agency abovementioned, but allow from the public purse the full sum that Timber Contractors are paid at the time for the like articles. It might be feared, that the present Contractors, and perhaps the Receiving Officers at the Yards, would violently oppose this plan: should it so occur, the Comptrollers and others, whose duty to the Public it is, to watch the conduct of the latter Gentlemen, might, by a vigilant attention to the manner in which that opposition was carried on, perhaps make some discoveries, of lasting importance to the Public; at any rate, they might soon effectually silence the opposition of their own servants to the measure, whatever they might do towards pacifying the middle Men, that now almost exclusively pass their Timber into the Royal Dock-yards.

In order to collect information on the many complicated facts and circumstances that relate to the planting, training, falling, sale, and converting of Navy or Ship Timber, a well-digested set of *Queries* were drawn up and circulated, in 1807, by the Commissioners for the revising and digesting the Civil Affairs of His Ma-

jesty's Navy, and Answers solicited from the several Planters, Timber-owners, and Professional Men, who were thought most likely to give useful information. Two of the Answers to this set of Queries I had the opportunity of perusing, some time ago, viz. those by the late Mr. Thomas Davis, of Long Leat, in Wiltshire, Agent to the Marquis of Bath, which he communicated also to the Bath Society, and who printed it in their "Letters and Papers;" and wherein he ably shows (as I have before observed, p. 227, Note), that the inferiority of the price of large Timber, compared with that of small, is the principal cause of the alarming and increasing scarcity of large Oak Timber: and the Answers by Mr. James Dowland of Cuckney, in Notts, Agent to the Duke of Newcastle, &c. which he showed me when at his House, and to which I have before alluded herein: The valuable and important nature of the information in the Answers by these Gentlemen, has made me anxious, before setting about this Chapter, to enquire if they and the other Answers had been printed, in order that I might refer to them: on enquiring at the Office of Woods, in Whitehall Place, in January last (1811), I was very politely shown two large Manuscript Volumes, one containing the Answers above alluded to, and the other, a set of Answers by the same or similar Persons, to a subsequent set of *Queries* issued by Lord Glenbervie, the present Surveyor-General of Woods, &c.; and both of which sets of Answers remain yet unpublished: a circumstance of considerable regret, as their contents ought not to be withheld from the Public. By recording here these latter Queries (which have been several times referred to herein), and a List of the Persons whose Answers have been received and preserved as above, I may hope to be instrumental in forwarding the

the desirable end, of the future publication of their Answers at length: while, in the mean time, the Queries themselves may have the effect, of turning Gentlemen's attention more to the important subjects to which they relate.

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*Office of Woods, Forests, &c.*
*London,* 21*st Dec.* 1807.

## *Queries relative to the Cultivation, Management, &c. of Navy Timber.*

1. Whether Oaks thrive best raised from the Acorn, the Seedling, or after an intermediate transplantation to a Nursery?

2. At what age is it best to plant Oaks, not sown?

3. Has it been *sufficiently* ascertained by experience, that it is injurious to shorten the Tap and lateral Roots of Oak when planted?

4. Should the lateral Branches be pruned, and if so, how near the Stem, and how high up?

5. Will not Oaks thrive in a great variety of soils and expositions, as in the very different soils of Sussex, where the land, almost close to the surface, is a loose fine whitish sand; in the rich loam of Dean Forest, Holt and Bere Forests, &c. or the poorer soil which prevails in many parts of the New Forest?

6. How near should Oaks originally be planted to one another?

7. How often, and in what proportion, should they be thinned?

8. How many should be ultimately left on an acre, or, in other words, at what distance should they be ultimately left from each other, or how much space should be allotted to each Oak?

9. Is it advisable to sow or plant Hollies, Hawthorns, Furze, or Broom with the Oaks when planted, as in open natural Woods the young Oaks are observed to thrive among Bushes of those Plants; or is the only advantage derived from those Bushes the protection from being trodden down, or browsed by Cattle?

10. If Oaks have been planted and suffered to continue too long close without thinning, will they upon being thinned swell out and grow in thickness of Trunk, or are they not more apt in such case to produce small lateral Branches and Foliage, without an increase in the diameter of the Trunk?

 11. Are

11. Are Oaks which grow in poor soils, and slowly, of a firmer texture, and more durable Timber, than when they grow in richer land?

12. May some of the large Limbs of an Oak be safely lopped with benefit, or without injury to the Tree; and if so, at what distance from the Trunk?

13. Would it be advantageous to sow or plant Beech, Sweet or Spanish Chesnut, Fir, Larch, or any other, and what, Trees intermixed in Plantations of Oak? Beech are observed frequently to grow up naturally in Oak Woods, sometimes a Beech from apparently one and the same stool with an Oak.

14. How many years does experience and observation shew, on the average, that Oaks will continue growing in height and thickness, when planted under reasonably advantageous circumstances of soil, method of planting, exposition, &c.?

15. How long, on the average, will an Oak remain without getting worse, after it has ceased growing?

16. Will an Oak continue to grow in thickness, and remain sound, after a considerable, or any part of the top Branches have become stag-headed?

17. Would it answer in point of expense, to trench the ground and sow it with Potatoes, or any other, and what useful vegetable, when a Plantation of Oaks is to be formed, of the extent of from one to several thousand acres?

18. What may be computed to be the successive expense per acre, of an Oak Plantation of 1000 acres planted in each of the ways above pointed out, (or in any other method which may be thought advisable, and which it is requested may be here mentioned, with the reason in favour thereof) yearly, for 100 years; and what the produce arising from thinning, lopping, and the ultimate sale of the Timber, and Bark, when full grown, computed in like manner successively by the year?

19. What is the best and most economical manner of felling? at what season how near the ground, with what Tools, &c.?

20. What is the best time and method for separating the Bark of Oak Timber?

21. How long, and in what manner, should Oak Timber be seasoned, before it is worked up in Shipping?

22. How long may Oak remain after it is fully seasoned, unwrought up, without suffering damage?

23. What is the best method and time for gathering Acorns, Beech

Beech, Mast, &c.?—How should they be preserved?—How long will they keep sound, and what is the best season of the year for sowing or planting them?

24. What is the best method of taking the solid contents, as well by actual mensuration, as by computation, of Timber standing, and of Timber when felled; and what are the principles upon which the different methods now in practice (and which it is requested may be here stated) are founded?

25. On what ground is it that the Load or Ton by round measure is reckoned to consist of 40 feet, and by square measure of 50 feet?

26. What is the best method of preparing Bark for sale? What are the different methods of measuring and selling Bark, either on the Tree, after it is stripped or hatched; and which, in sales on a large scale, is the most advantageous and practicable?

27. Is the Bark of Elm, or Sweet Chesnut, of sufficient value, as it may be used by Tanners or others, to make it an object of economy to separate it from the Tree, and whether that can be as easily done as in the case of Oak, or whether the operation would materially injure the Timber?

28. What is the most advantageous method to sell Timber, and least liable to fraud, theft, or inaccuracy; whether standing, or felled, lopped, barked, &c. at the owner's charge; and whether in the rough, or sided, at his charge; and also whether delivered on the spot to the buyer, or carried to the Dock-Yard at the expense of the seller?

29. What is the present fair average or market price of Navy Timber, whether straight, or in Knees, &c. inferior Oak Timber, Tops, Lops and Bark, and of Beech and Elm?

30. How much, and what parts of a Ship of War, according to the present practice of building for the King's Service, or the East or West India Trade, is or ought to be of Oak, and how much of that, British Oak, and how much foreign Oak, and how much other, and what other wood?

31. What is the difference in the specific gravity and density of Oak, Fir, Larch, Teak, and of other woods used in Ship Building?

32. Is the British superior to foreign Oak for the purpose of Ship Building? and if so, in what respects, and for what purposes particularly, and for what parts of the Ship?

 33. Is

33. Is any and what probable reason assignable for such difference, between British and other Oak?

34. What is the comparative excellence for Ship Building of the several different sorts of Oak Timber imported into Great Britain for that purpose?

35. Are there different advantages and disadvantages belonging to Oak Timber for Ship Building, according as it grows in Hedge Rows, close Plantations, among Coppices of Underwood cut periodically, or in open Wood Lands?

36. Do not Hedge Row Oaks yield the greatest quantity of Knee Timber, and regular uniform Plantations the greatest quantity of straight sound Plank?

37. Do the substitutes for natural Knee Timber, which have been tried or proposed, (whether metallic or wood, by pieces combined at angles) appear from experience, or in theory, to have sufficient merit to render the procuring such natural Knee Timber less necessary than has been hitherto supposed?

38. Which is the most valuable to the grower, the crooked Timber yielding most Knees, or the straight Stems?

39. Does experience show, that by cutting off the straight Leader, or bending it by some pressure, while growing, as has been proposed, or otherwise, an Oak Tree may be made to produce more Knee Timber than it otherwise would?

40. Which of the sorts of Timber used in Ship Building is most liable to be injured by iron or brass Nails, by remaining in fresh or in sea water, by friction against stony, sandy, or muddy bottoms; by warping or swelling, from heat, cold and damp, by splintering from the effect of Shot, by Worms, and other Sea Vermin, and by the contact of copper Sheathing?

41. What is the quantity per ton or load, of Oak and other Timber respectively, usually employed, on the average, according to the present received modes of Ship Building in this country, whether for the Fleet, or for the East or West India Trade, in proportion to the size of the Ship?

42. How long will a Ship of War, properly built, last, on an average, in the ordinary course of the navigation of the Ships in the British Fleet? distinguishing according to the materials, as Oak, Teak, Fir, &c.

34. How

34. How often must a Ship of War undergo a thorough repair during the average time of her duration?

44. What is the best method, proved by experience or practice, for preventing Acorns that have been planted or sown, from being destroyed by Field Mice?

45. What is the result of observation and experience, as to the raising Timber of a proper size and quality for the Navy, by permitting shoots to grow from Oak Stools cut in Coppice Woods?

46. At what age will Oaks favourably planted and well managed, become useful for the Navy, either as Knee Timber, or Plank, &c.

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Answers to the above Queries are requested to be made in writing, numbered successively, according to the Number of each Query; the person answering, when not informed as to any particular Query, merely stating that to be the case. It is of importance to receive early answers; and it is requested that they may be directed to Lord Glenbervie, Office of Woods, London.

GLENBERVIE, S. G.

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## The Answers to some at least of the above 46 Queries, were from the following persons, viz.

The Duke of Atholl.
Dr. Bain.
Sir Joseph Banks, Bart. Revesby Abbey, Lincolnshire.
Rev. Edward Bickerton, Ewhurst, Surrey.
John Boultbie, Esq. Warwickshire.
Mr. Arthur Capes, Whittlewood Forest.
Mr. George Chambers, Walworth.
William Churchill, Esq.
Mr. James Crozer, Alnwick.
John Christian Curwen, Esq.
Mr. James Davies, Dean Forest, Gloucestershire.
Mr. Dixon, Nurseryman.
Messrs. W. and A. Driver, Kent-Street-Road.
Lord De Dunstanville.
A Friend of Ditto.
Earl of Fife.
Lord Glenbervie.
Sir Archibald Grant, Bart. Aberdeenshire.
Mr. R. Harvey, Blithfield, Staffordshire.
Major-General Hope.
Mr. Thomas Jones, Forest of Dean.
Mr. Keir.
Thomas Andrew Knight, Esq. Elton.

Mr. John Knowles, Woolwich-Yard.
Mr. John Larking.
R. Marsham, Stratton, Norfolk.
Mr. Menzies, at the Duke of Montrose's.
William Mills, Esq.
William Mitford, Esq. New-Forest.
William Mitford, Esq. Pitt's-hill, Sussex.
Duke of Montrose.
Earl of Moray.
Mr. John Mudford, New-Forest.
Mr. Parkinson.
H. Peake, Esq. Commissioner of the Navy.
Uvedale Price, Esq. Foxley, Herefordshire.
Duke of Portland.
Sir William Rule, Commissioner of the Navy.
Lord Sheffield, Sheffield-place, Sussex.
Sir John Thomas Stanley, Bart. Alderley-Park, Cheshire.
Mr. H. Stone, Deptford-Yard.
John Wickins, Esq.
Arthur Young, Esq. Sackville-street.

In further corroboration of what has been advanced, on the inadequate price of large Timber, it may be right here, to quote the answer of Mr. Thomas A. Knight to the 18th of the above Queries, viz. "It is certainly the *interest* of the Planter to fall his Timber as soon as each Tree is worth 20*s*., and consequently before it is *fit* for the Navy."

The *Prices of Timber* of different sorts, in Derbyshire, have been already mentioned in several instances in this Chapter; it remains further to mention, that in 1811, good Spring Oak Timber, from 60 to 100 feet measure, sold about Wingerworth, at 3*s*. 6*d*. to 5*s*. 3*d*. per solid foot (round measure); smaller Oaks, from 2*s*. to 3*s*. 6*d*. per foot. In Mellor in 1808, tall Oak Spires, under 8 inches quarter girt, sold at 3*s*. per foot: in Glossop, 1808, Oak Spires at 1*s*. 6*d*. to 3*s*. per foot: at Knowl-hill in Ticknall, in 1809, Oak Timber at 2*s*. to 4*s*. per foot: at Walton-on-Trent wood, Oak Timber in 1809, at 5*s*. 6*d*. per foot.

*Oak*

*Oak Bark.*—This article is of such importance to the Manufactures of the Country, and to the growers of it, and is so liable to spoil from carelessness and mismanagement, that few things seem more to demand the attention of the Timber-owner. In a Letter to Sir John Sinclair, Bart. which has lately been printed in the 2d Part of the 7th Volume of "Communications to the Board of Agriculture," I have endeavoured to explain and enforce these objects, and to show, that the highly increased value of Oak Bark, demands the peeling and selling of it *by weight* in general; and that the Bark-Tools used in Bedfordshire, seem to me greatly preferable to the *Bones* and Irons, in use in Derbyshire; sets of both of these sorts of Tools being there accurately drawn and described: an Appendix to this Letter, by Mr. Thomas Knowlton of Edensor, explains the practice that prevails in most of the northern parts of Derbyshire, the western parts of the West Riding of Yorkshire, and the eastern sides of Cheshire and Lancashire, of peeling the Oaks *standing*, the reason assigned for the same, and the use of the Bones, in some parts of this County. The great length to which this Chapter has already extended, will preclude me from going over much of these grounds again: I cannot, however, avoid stating my objections to the practice of peeling Oaks or other Trees *standing*, which, however much it may formerly have prevailed, is now pretty generally laid aside in other districts, as being dangerous; can be performed only by the most active and able Men, is less expeditious than when the Trees are first felled (as I have explained in the place above quoted), generally occasions a considerable portion of useful Bark to be left on the small upper Boughs, and is unnecessary, for its principally alledged object, that of rendering the Timber

Timber better for not being felled in the Spring; since the Purchasers and Users of Timber, know, or make no distinction, in the price of the article, between Spring and Winter fell Oaks; and some persons have even asserted and attempted to show, that the Timber is better for being felled in Spring. The injury done to the future growth of the *Stools*, if not the killing of them altogether, is also a material objection to the practice; how much more objectionable, therefore, must be the practice of peeling Oak *Underwood* standing? and leaving it a whole Summer on the Stools, which I saw practised in Nether Padley, and some parts of Yorkshire near to this County. Altho' Oak, Ash, Elm, and other Trees, seldom crack at all while standing, after peeling, even by the Summer's heat, yet I found, in a considerable experiment for that purpose, made some years ago in Bedfordshire, that the Ash in particular, cracked almost as much as that fell before peeling, soon after it was felled and became dry; and that this is a conclusive argument against peeling Ash at all, and nearly so with me, against the peeling of Elm. Wheelers, and Lath and Pale renders, &c. in other districts, are found expeditious in getting home their Oak Timber, and in quartering it at least, if they don't cleave it up directly, and are heard to make none of those complaints for want of *peeling standing and Winter falling*, which it is said would here be made, if these objectionable practices (see p. 288) were laid aside, in the Derbyshire Spring Woods. The employment of Boys and Women*, to assist in the peeling of fallen

* Since the above was written, Mr. John Gratton informed me, that in the Season of 1812, he employed a Woman to follow the Peelers in Winger-

fallen-Trees, would much more than balance against the want of Men to cut down the Trees, which was alledged to me by some, as a principal reason for continuing to peel standing.

The vague and absurd practice of selling Bark by the *yard-set*, seems to have prevailed formerly, but has now been superseded in most parts of the County by the introduction of Weights and Scales, or Steelyards, for this as well as other articles. At Rowlee, Bark continued in 1809 to be sold by the Load of 10 quarters, or 70 yards-set, which then sold for 12*l.*; the Peelers (who used Bones on the standing Trees) being paid 3*s.* per quarter of 7 yards-set. In Wessington, I saw peeling performing, standing, in a more slovenly manner than I had before anywhere witnessed: the boughs were dropt and left in the public Lanes, in a very shameful manner, and in the Fields: the yard-set of Bark was only about 10 inches high, and few of the pieces of Bark were chopped, but mostly torn at their ends, which never ought or need be the case, when the Trees are first fallen.

The Peeling of Oaks is often continued too late in this District: at Wales, on the edge of this County in Yorkshire, I saw peeling still going on, on the 7th of June, 1809: and sometimes the Bark is neglected and left too long in the Field; on the E of Kedleston I saw Bark standing in a Ruck, among very high Grass, on the 16th of August, 1809.

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Wingerworth Woods, and collect the Bark from the falling Chips, and to peel the extreme Branches that had been cut off, higher than had been usual; and that she collected 31½ cwt. of Bark, that sold for 11*l.* 5*s.*, and her wages came only to 2*l.* 17*s.*! In future years, he intends to employ two or three Women.

The

The peeling of Bark in Ashover, has usually been paid for (by the Tanner or Purchaser) by the Load of 10 rood, or 70 yards-set, and in 1788 this fetched only Three Guineas; but in 1808, at the rate of Twelve Guineas! tho' not sold by that method, the weighing of it in the Wood, or at the Road Weighing-Engines having in the mean time been introduced: in 1807 it sold for Ten Guineas per Ton in the rough. The Tanners usually stack it at home under Dutch Barns, or moveable roofs. At Bretby, Oak Bark in the rough, weighed when dry, at a Road Engine, in 1807, fetched Fourteen Guineas per Ton, of 20×120lb. In Glossop in 1808, Bark, weighed in the Wood, sold at Ten to Twelve Guineas per Ton, the Tanner paying all expenses. Near Lullington, Bark in 1808 fetched 17*l.* per Ton, and in 1809 13*l.*, delivered and weighed at the Tanner's Yard. About Manchester (in Lancashire) I heard, that in 1808 Bark sold to a Tanner, when dry, in the Wood, at 18*l.* per Ton. In Mellor, Oak Bark weighed in Skips and Scales in the Wood, in 1809, sold when delivered at the Tanner's, at 15*l.* per Ton (20×112 lb.), the owner having paid for the peeling, at 25*s.* per Ton. About Markeaton, Bark is sold by the Ton, weighed at the Road Engines.

In Wingerworth, the Bark from Sir Thomas Windsor Hunloke's extensive Woods, has been sold by weight for this 23 years past, the Tanner paying for the peeling (now, about 30*s.* per Ton) and all expenses, and the Bark when dry, is tied up in bundles with a small cord, and weighed in the Wood, with Steel-yards, by the Ton of 20×120lb. By the favour of his very able Wood Agent, Mr. John Gratton, jun. I am enabled to state the selling prices per Ton in each year, viz.

1789,

| | £ | s. | d. | | £ | s. | d. |
|---|---|---|---|---|---|---|---|
| 1789, ........... | 3 | 5 | 0 | 1801, ........... | 7 | 0 | 0 |
| 1790, ........... | 3 | 10 | 0 | 1802, ........... | 7 | 10 | 0 |
| 1791, ........... | 3 | 12 | 6 | 1803, ........... | 8 | 10 | 0 |
| 1792, ........... | 5 | 0 | 0 | 1804, ........... | 9 | 10 | 0 |
| 1793, ........... | 8 | 10 | 0 | 1805, ........... | 10 | 0 | 0 |
| 1794, ........... | 5 | 10 | 0 | 1806, ........... | 10 | 7 | 6 |
| 1795, ........... | 6 | 0 | 0 | 1807, ........... | 12 | 0 | 0 |
| 1796, ........... | 7 | 0 | 0 | 1808, ........... | 14 | 0 | 0 |
| 1797, ........... | 5 | 0 | 0 | 1809, ........... | 12 | 0 | 0 |
| 1798, ........... | 6 | 0 | 0 | 1810, ........... | 12 | 0 | 0 |
| 1799, ........... | 5 | 5 | 0 | 1811, ........... | 10 | 10 | 0 |
| 1800, ........... | 6 | 6 | 0 | | | | |

If we were to suppose, with Mr. John Bailey (Durham Report, p. 190), that the Tanner's expenses in peeling, drying, carriage, stacking, and cleaning, or shaving and hatching, amount to 4*l.* per Ton, and allow 60 cwt. of rough Bark to make 45 cwt., or a London *Load* of hatcht Bark, the same would stand the Tanner, in 1808, in the very great price of 54*l.* per Load, or more than 2½*d.* per pound of hatcht Bark.

Near to Goyte-bridge, I saw Oak Bark laid on two Poles, 15 or 18 inches above the ground, supported by forked Sticks drove into it, for drying, with the flesh or peeled side downwards, and when thoroughly dry, it was closely and neatly stacked up in the wood, like a small haycock almost, that seemed about four feet diameter and five feet and a half high, with a conical roof, formed of the largest pieces of Bark. In Kinder, I saw similar stacks of Bark, in a Wood. In Mellor these stacks of Bark are called Rucks; a standard *Ruck*, by which the Bark is sometimes sold, instead of by the Ton weight, should be just two yards diameter,

meter, and one yard and a half high, in form of a cylinder, surmounted by a conical roof of the true or right-angled pitch, or one yard high, as near as may be, pretty closely packed; containing of course $5\frac{1}{4}$ cubic yards (very near), or $155\frac{1}{2}$ cubic feet, which, they told me, weighed from $6\frac{1}{2}$ to 10cwt., or perhaps 8cwt. on the average, or two-fifths of a ton. The Wood-owners here, employ the Peelers (as ought always to be the case), and pay 11*s*. or 11*s*. 6*d*. per Ruck, as above, for peeling, drying, rucking, and loading the Tanners' Teams, when they come; and sold in 1809 at about 5*l*. 18*s*. per Ruck.

Mr. Richard Parkinson, in his Report on Rutland, p. 105, mentions Bark being sold there by the cubic yard, or rather by the *load* of 20 such yards, weighing 30 to 35 cwt., which, tho' heavier Bark (or more weight to the cubic yard, according to this) than in Glossop as above, sold in 1808 for only 10*l*. per Load, the Purchaser paying the peeling.

I have been thus particular, with respect to the mode of peeling and selling of Bark by the *cubic yard*, as one attended with *less trouble* than weighing it; especially if it is not sold while in the Wood, but peeled, dried, carried and stackt, and securely thatcht (top and sides also), or packed close in tight Barns, on the grower's own account, for sale, when the consumption and markets required it: which I think that sound policy as much requires of them to do, as of the Farmers to continue to gather, stack, and embarn their crops, as at present, instead of precipitately, and all of them at one season, seeking for purchasers of their crops *in the Field*. From stacks of regular form, capable of being easily and accurately guaged, or the cubic yards ascertained, the Bark might either be sold out by the yard, or the ton; and until one of these methods could

be

be preferred on proper reasons and experience, it would be easy to guage the stacks first, before weighing, and by which, proper average proportions between the measure and weight would soon be established. In several years that succeeded 1793, I stacked great quantities of Bark, of different sorts, weighing all of it into the stacks, and some of it out again, after different periods, the practical results of which, as well as of numerous other very large and varied experiments, in measuring, Bark and the Timber from whence it was peeled, weighing, shaving, and selling of the same in different modes, I should have been happy to have given in this place, if my time would have admitted of drawing out the particulars, from the voluminous rough papers of my Woburn Agency, and of making the requisite calculations: to the Derbyshire Wood-owners these are also less necessary, than in many other districts, where the highly absurd method, of paying for peeling, and the selling of Bark by the lineal *yard-set*, still prevail; and as in this County, I did not hear of any instance, of another scarcely less indefinite and improper mode of selling Bark, viz. at so much *in the pound* on what the Timber sells for, thereby involving the facility or otherwise, of disposing of the *Timber*, which has little or no relation to the demand the Tanners may find for *Bark*, besides the other uncertainties, in common with another method (still very much used in England), viz. by the *Load of Timber*, arising from the indefinite and varying proportions between a certain solid *measure of Timber*, and the quantity, weight, and quality of Bark, that comes from its trunk and branches, under different circumstances, of the ages and sizes of the Trees, their exposure, size of heads, &c.

The Bark from Underwood, and Thinnings of Oak Plantations, having in Bedfordshire, exceeded the

whole value of the Poles and their Lop, while in the same season, the Bark from large Trees, in close Groves, has fallen short of one-fifth of the value of the Timber and their tops that yielded it! yet I remember, and was principally induced by the circumstance, to take the immense pains that I have alluded to above, that there, 5*s*., 6*s*., or 7*s*. *in the pound* value of Timber, was in different previous seasons, considered by the Bark-growers and Tanners, as proper prices and modes of estimating the value of the article, not less so than 32*s*., 36*s*., &c. *per quarter* for Corn, or others of the usual denominations of articles: but the fallacy of which will at once appear, on considering, that during the growth of Trees, the quantity of Bark is proportionate (or nearly) to the *surface* of the Tree, but the Timber to its *solidity;* and that these are nearly proportionate to the *squares* and the *cubes* of any like dimensions of the Trees, as their diameters or circumferences, &c.

Since these subjects have been so slightly passed over in the York West Riding Report, I shall perhaps be excused for mentioning here, that a Timber-dealer, whom I met at the Commercial Inn at Sheffield, informed me, that until lately, the best sort of thick or *Bend* Leather, for which that district was famous, was made from chopped (but unground or uncrushed) Bark, in pieces about an inch square, the slow spending of which among the Hides, was supposed to convey to this Bend Leather much of its valuable properties, as Sole Leather; and that the sale of Bark here, was by the *quarter*, of 18 heaped half-bushels or strikes, of this chopped Bark, supposed equivalent to a fathom of Bark set up; and that the Wood-men were paid by the quarter for peeling, drying, shaving, and chopping or hatching the Bark, in the

the Wood, previous to measuring it there to the Tanners, who kept it at home for use, in close Barns. Now, however, the peeling and sale there is generally by the ton in the rough, and all the large Tanners, only shave their Bark, before passing it thro' powerful machines that grind it to powder; and that the tan is extracted from this by fire, in operations something like Brewing, before the Tanning commences. At Settle, which used to be a noted Market for this Bend Leather, it was exposed for sale, after being brushed or painted over with Clay and Water, mixed as Paint, during the drying of the Hides, in order that the slightest degree of moisture remaining in the Leather, might be detected at the time of Sale, by the dampness of this thin coating of Clay.

In a District like most of Derbyshire, where the extreme twigs and buds of the Oaks are of no value for Firing, when felled, it is to be lamented, that Women and Children are not employed to cut off and collect these, and press them into Bags when dry, for early use by the Tanners, after crushing them under their Rolling-stones, as has been practised in Cheshire, according to Mr. Henry Holland's Report, p. 326, and as is general, in South Wales, as I was informed when there in October 1810, by Mr. Thomas W. Williams, an eminent Timber and Bark dealer.

In the Woods and Plantations at Kinfauns, in Perthshire, in Scotland (see p. 301, Note), Mr. William Campbell prunes Lord Gray's Oak Trees in the Spring, in order that the Bark may be stripped, and has not found the least perceptible mischief to the Trees from this practice.

I have only further to mention, before I close this Section on Timber, that I saw at Mellor a very com-

plete and safe *Whim*, or two-wheel'd Carriage, with very long and strong shafts, for moving large Trees small distances, that had a strong roll, furnished with ratchets and holes for levers or hand-spikes, which was mounted on tall blocks of wood above the shafts, and rather before the axle; which last was bent up in the middle, to make room for the Trees under it; and that both ends of the chain, after passing under the Trees at their centres of gravity, was fastened to this roll, by which they were wound up and suspended, and afterwards let down again, with ease and safety; and that at Belper, Messrs. Strutts have, perhaps, the best contrived Kiln or House for completely *seasoning* Timber and Wood of all kinds, before it is used by the Joiners, Turners, &c. in any part of their extensive Factories, that is any where to be seen.

CHAP.

# CHAP. XI.

## WASTES.

### SECT. I.—MOORS.

THE quantity of Moors, or waste and barren unfenced Lands, remaining in the County, is now far less than has been supposed, and perhaps one-half of these are not Common, but Private Property, belonging exclusively to the Duke of Devonshire, in the Woodlands of Hope, and to the Hon. Bernard Edward Howard, in Glossop Lordship, adjoining.

The principal tract of Common Moors, is called the East-Moor or the High Moors, and extends northward from Ashover and Darley Parishes, almost to the bounds of the County, within the Manors or Liberties of Great-Rowsley, Brampton, Barlow, Holmsfield, Totley, Baslow and Curbar: the extensive Moor in Hathersage, north of them, being now under Inclosure, and I believe by this time allotted; and so is Beeley Moor. The following is, I believe, a pretty accurate List of the Places now having *Open Commons*, or Moors, with the principal Soil of each Common, viz.

Abney and Grange in Hope parish (on Grit and Shale).

Alfreton (on Coal-measures).—Notices given in 1811, preparatory to an Inclosure.

Apperknowl in Dronfield (Coal-measures).

Astwith in Alt Hucknal, small (Coal-measures).

Barlow in Staveley (Coal-measures).
Baslow in Bakewell (Grit and Coal-measures).
Brampton in Chesterfield (Coal-measures).
Brimington, small (Coal-measures).
Church Gresley, 20 acres (Coal-measures).
Curbar in Bakewell (Grit and Coal-measures).
Dalbury Lees, in Dalbury, small (Red Marl).
Dethick in Ashover (Grit and Coal-measures).
Elmton (Yellow Lime).
Great Rowsley in Bakewell (Grit and Coal-measures).
Heath, small (Coal-measures).
Hollington in Longford, small (Red Marl).
Holmsfield in Dronfield (Coal-measures).
Langley (Kirk), 130 acres (Red Marl).
Linton in Church Gresley, 45 acres (Red Marl).
Little Chester in St. Alkmund, very small (Gravel on Red Marl).
Little Eaton in St. Alkmund, small (Grit).
Middleton in Yolgrave (1st and 2nd Lime).
Offerton in Hope (Shale).
Oneston in Dronfield (Coal-measures).
Roston in Norbury, 140 acres (Red Marl).
Shatton in Hope (Shale).
Smithsby (Alluvial Clay and Coal-measures).
Snelston in Norbury, with Yeveley (Red Marl?)
Swadlingcote in Church Gresley, 35 acres (Coal-measures).
Tansley in Crich (2nd Grit and Coal-measures).
Totley in Dronfield (Coal-measures).
Whitfield in Glossop (Grit).—Notices given in 1809.
Whittington, small (Coal-measures).
Whitwell (Yellow Lime).—Notices given in 1811.
Yeveley in Shirley, with Snelston (Red Marl?)
Yolgrave (1st Lime).

Elmton Common exhibits one of the most lamentable instances of deep Cart-ruts, and every other species of injury and neglect, that can, perhaps, be shown, on useful Land: part of it has been ploughed at no distant period, as completely exhausted as could be, and then resigned to Weeds and Paltry.

Hollington Common, of 20 or 30 acres, tho' overgrown with Rushes thro' neglect, is on a rich Red Marl soil. Some of the Farmers having common right here, let to Cottagers the run of a Cow on this Common, from May-day till Harvest is ended, at 30*s*. to 42*s*. The truly impolitic and unnecessary *fees* and expenses on Inclosure Bills, doom this Common to its present state of neglect, as already observed, p. 78.

Langley (two) Commons, on similar soil to the last-mentioned, have the obstinacy of an Individual, opposed to their improvement, as I was told, as well as Parliamentary and Lawyers' *fees*.

Roston Common, near to Birchwood-moor, is miserably carted on, cut up, and in want of Draining: in wet seasons it generally *rots the Sheep* depastured on it; few can stand it two or three years; and on this account it is probably injurious, rather than beneficial, in its present state, both to the Parishioners and the Public.

The *High Moors* above-mentioned, are distinguished into black and white Lands, the former being by far the most extensive, and are uniformly covered by Heath, which at a distance appears of a dark brown, approaching to black, of a most dismal aspect; the latter are the better and green parts, where Grasses prevail instead of Heath, or the aquatics on the very wet peaty parts called Mosses, which are still more dreary in their appearance than the black Heaths. The fol-

 lowing

lowing are a few Memorandums that I made on the Herbage of these disgusting Moor Lands.

Bilberry stems, Black Whorts, Wortleberry, or Huckleberry *(vaccinium myrtillus)*, are the next most prevailing Herbage on the Moors, after and among the Heaths, especially where the soil is rather looser and better in quality, than where short Heath is alone seen, and which parts are generally found far the most difficult to improve: Moors much abounding with Bilberry wyzles or stems, are very unproductive of keep, and won't summer, or carry much more than half a Sheep to an acre, exclusive of the improved valleys. The Bilberry, a small black Fruit, is gathered by the Poor; and used for Puddings and Pies, and it is also served up in Desserts at the Tables of the more wealthy, in the vicinity of the Moor Lands.

Cloudberry *(rubus chamæmorus)* is sometimes found on the Grit-stone N of Buxton, and elsewhere.

Clusterberry, very much resembles the Bilberry Plant, but has larger leaves on a smaller and more wiry stalk: they abound less than the Bilberry, and are alike worthless to the Farmer.

Cowberry, Red Wortleberry, Whort, or Crowberry *(vaccinium vitis Idœa)*, is found on parts of the Grit-stone Moors: the Berries are mealy when ripe, and the Leaves nearly like the Bilberry, but smaller.

Cranberry *(vaccinium oxycoccus)* grows and ripens its Berries, which the Poor gather, in some of the moister parts of the Moors.

Crowberry, Crake-berry, or Black-berried Heath *(empetrum nigrum)*, differs little in leaf from the sort of Heath here called Ling, but has not the same wiry stalk: its small black Berries are not used, being bitter and vapid to the taste.

Heath

Heath of the common sort *(erica vulgaris)*, is much too common, according to the view which I have taken of its effect, in producing Fox earth and other most unfertile vegetable soils, Vol. I. p. 305. It abounds on all the Moors, and on most of the remaining Commons in this County, in a less or greater degree. Within a few years past, nearly all the fine Limestone Hills between Ashburne and Buxton were occupied by Heath, which is now happily becoming rather scarce there; and when the only remaining Commons, or unimproved Lands in this calcareous district, in Middleton, Yolgrave, &c. shall have been inclosed, pared and burned, and limed, &c. this noxious and useless Plant will, I hope, disappear altogether from this District. The cross-leaved Heath *(erica tetralix)*, and another species *(erica cinerea)*, are also common in some parts of the Moors; one of these being known by the name of Ling in the northern part of the County, and as rather more worthless, as Herbage, than the common Heath: the fortunate disappearance of these Heaths, Ling, &c. in favour of Dutch Clover and useful Herbage, after a profuse Liming of the surface, has been alluded to, p. 159, and will be further noticed in Sect. 2, of the next Chapter.

Lowk Grass, a kind of fine Benty Grass, occupying the wetter parts of the Moors, is found more productive of keep than the coarse Bents that occupy some other parts, among the Heath, Ling, and Bilberry Plants.

SECT.

## SECT. II.—MOUNTAINS.

This County contains no Mountains of such an elevation and rocky nature, as to unfit them for useful vegetation, but every part of the Derbyshire Hills might either be clothed with Grass or with Timber and Wood, as I have often hinted in the last Chapter: even the *slitker* or durable rubble of limestone (Vol. I. p. 303) that so curiously remains in a loose state on the skirts of some of the hills, might be clothed with Ash (see p. 246) and other long-rooted Trees: and the deep *Peat* tracts or Mosses which I have rather represented in the passage first above quoted, as incapable of improvement, would probably admit of the culture of Dr. Richardson's Fiorin, or Irish Grass, as I shall mention in the next Section. Of the various improvements that have been, or remain to be practised on the Hills in this County, except planting, which has been fully treated on in Chapter X., I shall speak under their proper heads of Draining, Paring, Burning and Liming, in the next Chapter; but of one that is rather peculiar to particular spots, for which the "Plan" that I follow in these arrangements has assigned no place, I shall here speak, viz.

The *ridding* or clearing of lands from large blocks of loose or self stones, scattered on the surface, is a very necessary and frequently a very expensive operation, in order to introduce cultivation, but against planting, such stones are seldom any material bar. The phenomena of these loose blocks of stone have been described, and the most extensive accumulations of them which yet remain, particularized, in the First Volume, p. 144. On the S E side of Ashover Town, S W of Lea, S E

of

of Matlock, at Wadsley N of Sheffield in Yorkshire, &c. I saw this operation going on: the stones being broken and removed, and the ground trenched by the spade to 12 or 18 inches depth, in most of such instances. Mr. George Nuttall of Matlock, stated this Ridding to cost, from 1s. to 1s. 6d. and 2s. per rood of seven yards square (.01024, or a trifle less than 1-100th of a statute acre), or at the rate of 5l. to 10l. per acre for getting up the stones; which afterwards cost 50s. to 70s. per acre for clearing them away, to where the wall fences are to be built, pits or steep waste places are ready to receive them, or where large stacks of them can be made in the fields (as may be seen on the slope of Riber Hill S E of Matlock, on the slope of Fabrick Hill S E of Ashover, Foxhole-bank in Wooley-moor, &c.); and that after the wall fences have been built, such ridded lands, before of very little value, have been let to Farmers, at from 10s. to 30s. per acre.

## SECT. III.—BOGS.

The circumstance, of very few Vallies or hill sides producing Peat Bogs or Mosses of any extent in this District, but that such are generally found on planes of Grit or Sand-stone Rocks* in the higher parts of the most elevated

* In mentioning the great Bogs of Ireland, Vol. I. p. 312, as exceptions to what I had every where myself observed, viz. that silicious and not argillaceous matters were the soils on which Peats always grew, I had reference to the analysis of Mr. Richard Griffith, jun. (Philosophical Magazine, Vol. 36, p. 37) of what he calls "yellowish-blue Clay," often found under the Irish Bogs, viz. Alumine 72, Carbonate of Lime 6, and Silex coloured by Iron 22 parts, in the 100: but Dr. William Richardson

vated tracts in this part of the kingdom, has been mentioned, and the limits of these tracts producing Mosses pretty accurately described, p. 309 of the First Volume: as also that they are not composed of decayed wood, as many have too hastily concluded, because wood and even large Trees are frequently found in the Peat of these Mosses (I. p. 382), but are formed of great accumulations of the grey Bog Moss (*sphagnum palustre*), Cotton Grass (*eriophorum polystachion*), Heaths (*ericas*), Marsh Horsetail (*equisetum palustre*), rushy Bents, and other aquatic small plants, which can still be seen growing on the edges and wetter parts, of the most black and rotten of these elevated Peat Mosses. The following are some of the thick or deep Mosses that I have noticed, viz.

Baslow E, and Brampton NW, near Clod Hall (Leachfield Moss).
Beeley SE (Beeley Moss).
Buxton N (Combes Moss).

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Richardson, in some important Observations on the Irish Bogs, lately published in the "Agricultural Magazine," Vol. X. p. 81, says, speaking of the practicability of procuring *Clay* to manure or improve these Bogs with, that near the shallow edges of the great Bogs, he was not fortunate enough, in an anxious search after Clay, to find any such, but "a tough, viscid, ponderous and whitish earth," which, when analysed by his scientific College Friends in Dublin, gave Alumine 16, and Silex (coloured by one of Oxyde of Iron) 84 parts, in the 100: whence it appears, that the Irish Peats, in reality, rest and originally grew, on silicious matters, as in Derbyshire, Bedfordshire, and every where that I have observed these aquatic vegetable accumulations. The real distinctions between Low-land and Mountain Bogs that Dr. R. has established in the paper above referred to, are perfectly observable here, between Synfin Fen and the few other Valley Bogs of this District, and its more extended Mosses or high peaty Moors, on which last, from their uneven surfaces, little or no water can ever stagnate, as Dr. R. observes of the Irish Bogs.

Darwent Chapel N (Cutt-gate Moss in Yorkshire).
Flash S E, near Royal Cottage (Peat Pits), and Moredge, Staffordshire.
Glossop N E (Turf Pits), and E (Doctor-gate Moss).
Hathersage N E (White-Path Moss) and N (Stanage Moss).
Kinder E (Kinder-scout Moss).
Moss-houses W, and N W (Goyte Moss), and S SE (Thatch Marsh).
Rowlee S S W (Crookstone, Peat Pits) and N E and E N E (Peat Pits).
Stanage, S W of the Cupolas in Ashover (Peat-moss Dam).
Woodhead N W (Featherbed Moss) and N (Holme Moss), in Cheshire.
Woodlands of Hope, several large Mosses.

Fresh currency has lately been given *in print*, I have observed, to an idle and improbable story, that Leachfield Moss near Clod-Hall, is the site of an ancient Town, though the least vestige of roads leading to it, or other indelible marks of long occupation by man, do not appear near it. I observed in passing along the western edge of Stanage Moss, N of Hathersage, from Crow-chine to Stanage Colliery, that the firing of the Heath, on the first grit at the edge of the Bog, at stated periods, in dry weather (as will be mentioned in Section VI.) had at different periods set fire to the Peat, and into which it had continued to penetrate, and make large and irregular holes, apparently, until heavy rains fell to extinguish it: this source of unevenness, and of the groughs and gullies, and of local dead black places on the surface of these Mosses, is perhaps more common than has been supposed. Of the attempts

tempts that have or may be made, with the probability of success, to drain these Mountain Bogs, I shall speak in Section I. and of the uses that have been made of Peat as Manure, I shall speak in Section III. of the next Chapter; and as Fuel, it will be further noticed in Section III. of Chapter VI. The cultivation of Oziers on small Local Bogs has been mentioned, p. 261.

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## SECT. IV.—FENS AND MARSHES.

I HAVE already mentioned (Vol. I. p. 308), that Synfin Moor, or Syn Fen, N of Swarkestone, is the only Marsh or Fen in this County: and which was an open Common, on which the Races of Derby used formerly to be held, until they were removed to the Meadows by the side of the Derwent, where it makes a large bend SE of the Town: the increasing wetness of this Marsh, probably occasioned this alteration: some years ago the Derby Canal was cut, or rather embanked across its eastern skirt, and probably has added to its wetness. The Peat here seems of considerable thickness, except near the outsides, and the surface is very flat, with a pretty uniform covering of whitish clay, or sediment from the waters, that have stagnated upon it, and which soil would be very productive of Corn or Grass, if the drainage were more complete. It is said, that there were no Parliamentary Provisions for enforcing the making and maintaining of proper *roads* across this Fen, at the time of its Inclosure, under the late Mr. Samuel Wyatt, as sole Commissioner, about the year 1805; and the fact seems to have been, that nothing was done in this respect, but fencing off the roads, on this rotten ground, and leaving the travellers or inhabitants

bitants to flounder through or founder in them, as they could: in attempting to cross this Fen from Swarkestone to Synfin Village, on the 2d of October, 1809, in order to see its state and condition, I had well nigh mired and ruined my horse, in the numerous and scandalous Sloughs that are already formed, quite across these roads, in many parts, particularly about half a mile S E of Synfin: all the Ditches were at that time brim-full of water, and seemed nearly choaked with weeds; about a quarter of a mile E of Synfin, two or three acres were actually under water, and so were large patches in other parts of the Moor.

This state of the Fen was ascribed by the Farmers with whom I conversed, to the flood that at that time prevailed in the Trent, backing or penning up the only drain from this low tract, which passes on the east side of Swarkestone Town: this being the case, it is clear, that the proper principles have not been acted upon, in the attempt to drain this Fen, at the time of the Inclosure, in suffering the considerable Brook that enters it N E of Synfin, from Little-over Township, and several smaller ones at the northern part, to continue to *discharge their waters on to this flat tract of land*, but which ought to have been conveyed in catch-water or upland Drains, at the skirt of the Fen, to a separate outfall into the Trent flat, on the level of its highest floods or higher: the low, or present system of drains in and from the Fen, ought perhaps to be more capacious, in order to catch and hold the soakage and rain waters that fall within the Fen, during such times as the Trent is too high to admit of their running out; and for preventing the waters of the Trent from backing into them, a good close-shutting valve or gate, and an embankment, should be constructed, at the narrowest part

of

of the valley or outlet, at the NE corner of the Fen*; by which works, kept in proper order, this valuable tract of 1400 acres, perhaps, would be at all times dry and sound. Perhaps, owing to the difficulties that the Derby Canal Proprietors would oppose to the passing of the Catch-water drain under the same, at a level so near to its own, at the north-east corner of the Fen, unless they would consent to the discharge of these waters into their Canal? and there being no stream entering the east side of the Fen, it might be advisable and practicable to commence the Catch-water, or Upland Drain, at or above the NE corner, and carry it round westward and then south, to intersect and receive all the live or running waters at a higher level, and before they enter the Fen; and that the same might be discharged across the low neck of land near Arleston, into the Brook that passes E of Twyford, without at all interfering with or requiring fresh culverts under either the Derby, or the Trent and Mersey Canals. How much it is to be lamented, that these things were not better considered, and the necessary surveys and levels taken, previous to the Inclosure: the evils, however, of an imperfect Drainage, are so great and pressing, and the loss to the Proprietors and the Public so

* The Floods of the Trent, of sufficient height to affect the out-fall from this Fen, are mostly of such short duration as not to require any *Draining-mill* (p. 61), such as are commonly wrought by Wind in the Fens of the Eastern Counties: and were it otherwise, it is probable, that a *Steam-engine* would answer better than one of these antiquated wooden Machines, as has been shown by Mr. W. Walker of Horncastle, in the "Repertory of Arts," Vol. XXI. p. 270; whose Tables, and calculations of the prime cost, annual expense, and performance of these Engines, in draining Fens, under all the variety of circumstances, seem well entitled to the attention of the owners of Estates in the Fen Countries.

consi-

considerable, that the further and perfect improvement of this fine tract of land, ought not any longer to be delayed.

## SECT. V.—FORESTS.

PART of what was formerly the *Peak Forest*, has long formed the extra-parochial Liberty of the same name, with not a Tree or Bush upon it, but what is of modern date or planting: green Fields and stone wall Fences having succeeded. About the Town and the detached Farm Houses, there are a few very thriving Sycamore, Ash, and other Trees, whose luxuriant foliage show, that the District was not ill adapted for Wood; and that the entire destruction of the Wood here, and in most other parts of the Peak Hundreds, or King's Field, is not to be ascribed to the soil or climate, but to the system under which improvident Man, has cut down all before him, and supplied starving Cattle to bite up every leaf and twig, as fast as the stools have sprung again, until at length they died, and the land was at last left totally destitute of Wood, as I have observed, p. 382, of the 1st Volume, and in the last Chapter of this, p. 251. The same causes have and still continue to operate, in the open parts of Mansfield, Papplewick, and Newstead, and other districts of *Sherwood Forest* in Nottinghamshire, towards *the entire destruction of Wood*, and the establishing of the empire of the puny and noxious Ericas, in place of the noble Quercus, the rightful Lord of these Soils: since no one can imagine, that the few stunted Oaks that yet remain, to give a colour to the term "*Forest*," on the S and S E of Mansfield, will ever have a single succes-

sor, under the present system of common-rights, where they grow.

In *Needwood Forest* in Staffordshire, the land being of better quality, and great part of the spontaneous Herbage, that sprang up among the Wood on its being cut, proving much more nutritious and productive to the Cattle, than the Heath only, that has succeeded in Sherwood, and too many other places, they were less forced to browse on the young shoots and twigs of the rising Wood; and they had not, nor perhaps ever would have, so effectually cleared the land in Staffordshire of Wood: and thus it has happened, as if for a punishment of Man's folly, that this system of cutting down Wood without protecting the stools from Cattle, *accumulated and hard kept on the spot*, has exterminated the Wood, first most effectually on those parts where the soil was poor, and fit for nothing else but Wood (consigning it to the Ericas), and left a scraggling crop of Wood on all the richer soils, where it sprung most vigorously, and Cattle were otherwise supplied, and where it might, on the contrary, have been desirable, that Grass and useful Herbage had taken the place of Wood, as Population and the wants of the People for Meat, proceeded. I am happy to add, that Common-rights throughout every part of Needwood Forest were extinguished, before I visited that part, in the course of my Mineral Survey; the Deer had all, I believe, been removed; good Roads had been made; the whole was fenced, and under a course of cultivation, except the most woody parts, which had been allotted to the Crown, and were fenced in as Oak Woods: and in which I hope and trust, that a system of management will be pursued, almost the reverse in every particular to that which has hitherto prevailed,

here

here and elsewhere, on the Public Woodlands: otherwise, the just expectations of a People, fast improving in knowledge, as to the benefits to be derived from these best parts of Needwood Forest (for such the Red Marl soils of these Woods seem to me to be), will be hereafter grievously disappointed.

It may, perhaps, be excused, if I add here, that a new Church has been built, attached to Tutbury Parish, and called Christ-Church in Needwood, and was dedicated, on the 15th of August, 1809, by the Bishop of Lichfield and Coventry: a new Parsonage House and Farm Premises had been erected near the Church, and the Lands attached to it in lieu of Tithes had been let, under an improving lease for 40 years, in pursuance of the Act for dividing and allotting this extensive Forest. I wish I could add, that a good system of cropping had generally began to be acted on by the cultivators of the new private Lands on this Forest, but which I thought far from the case, when I saw almost the whole of them under white-straw'd Grain at once, and much of them under the second or the third crops of this kind, if I was rightly informed.

*Charnwood Forest* in Leicestershire, the only other Forest near to Derbyshire that I have visited in this Survey, is almost Tree-less, and is now under Inclosure, as mentioned, p. 154, Vol. I.

## SECT. VI.—HEATHS AND DOWNS.

Of Heaths or Moors, this County had formerly great tracts, and still has too large a portion of such, considering their uselessness, as observed in Sect. I. of this Chapter; but no *Downs* or extensive Hills covered with

thick short Grass, like the Chalk-downs of the South-eastern Counties, are found in it: the Limestone Hills of the Peak Hundreds being too prone to Heaths *(ericas)*, to have had any Grass tracts, but where the treading and frequent lieing and dunging of Cattle, had exterminated or weakened the Heath, or where Lime had been spread by the Husbandman, for its destruction; and the Yellow Lime Hills in Scarsdale Hundred, where the Heath has not spread, are almost invariably covered with Shar-grass *(festuca pinnata*)*, a sharp and very worthless Herbage, as observed, Vol. I. p. 161, and p. 201, of this Volume.

On the waste Grit-stone Lands, *Heath* has considerably prevailed, and there, as well as on the sandy or clayey Commons or neglected Lands, *Furze*, Gorse, or Wins *(ulex europæus)*, has been suffered to cover much too large a space, when it is known, that the same is not here at all, I believe, used for domestic Fuel, or in the burning of Bricks or Lime (as in the Southern Counties), or for any other purpose, when cut from the Furze-covers of the Sporting Gentlemen, but that it is occasionally removed from the Commons and some other Lands, by setting it on fire, leaving the blackened dead stalks as a most unsightly nuisance. I have been informed, that a Tenant of the Duke of Devonshire, on the Staffordshire border of the County, fed his Horses on chopt and bruised Gorse, that had been passed between the rollers used at Ecton Copper Mine. The Commons, and other neglected Lands in the County, are in the above manner, cleared of their tall *Heath* or Ling, at different periods, by setting it

* The *Bromus pinnatus* of Dr. Smith, and the Spiked Heath Brome Grass of some Writers.

on

on fire, and leaving the black and half-burnt stalks to increase the dark and dismal appearance of these disgraceful tracts. The object of thus burning the tall Heath is, that young Plants of the same kind may spring up, better adapted than the old ones to the mouths and palates of the half-starved animals that are compelled to subsist on this miserable fare. In such a slovenly and barbarous mode of partially removing, or rather killing the stems of the old crop, it is no wonder that a young one is very slow in succeeding, and that the profit from these lands is so trifling, that 1*s*. per acre per annum has been mentioned as a fair Rent for Heath Land, and some scores of acres near to the parish of Matlock, have remained unlet even at that, and unoccupied for near 30 years, after having been fenced in; and others, after some years trial, on this absurd system, have been suffered to revert again to the neighbouring Commons, by the entire neglect of their wall Fences: and yet finer Plantations of *Larch* and Scotch Firs need not be seen, than many that are intermixed with, and on the very same stratum and soil, with these unproductive and disgraceful Heaths or Moors. It has been thought by some, that the burning of the Heath from time to time, has occasioned the blackness or dark brown colour of the Grit-stone, or sandy soils on which it prevails, but which I have noticed, and considered, as the sterilizing effect of these Ericas, Vol. I. p. 305, and in this Chapter, p. 345; and in confirmation of my opinion, it may be right to state, that on the sandy Heaths and Warrens in Bedfordshire, and other still more Southern Counties, where firing the crop of Heath, or any other Plants on the ground, has probably never been practised; but on the contrary, the same is closely hoed up and carried off for Fuel; or, as frequently, a thin turf of the

soil is cut up with the Heath (or Ling, as they there call it) by a Breast-plough, and carried off each time to the Cottages and Farm Houses, that the surface-soil, as far as the small roots of the Heath descend, is scarcely less black, or unlike the white, yellow, or red Sand or Loam beneath it, either in colour or quality, than in the North, where firing the crop has been practised time immemorial, and no part of the soil removed, to expose fresh surfaces.

Broom (*spartium scoparium*) is found on some drier and looser parts of the Heaths here, but less commonly, I think, than in the Southern Counties: it is alike worthless and useless here, with Heath and Gorse, and ought entirely to disappear in this District: since Corn, Grass, or useful Trees, might in every instance occupy its place: the preparing of a sort of Hemp from its stalks, which some have recommended (see Phil. Mag. Vol. XXXIV. p. 378), is, I think, less likely to answer than the above, either to the occupier or the Public.

Fern, Bracken, or Brakes (*pteris aquilina*), appear on such parts of the Heaths as have a deep loamy or a sandy soil with a moist bottom, for its long and large roots to strike into: its place would be better supplied by Corn, Grass, or Wood, as not any animal eats of it, I believe, and it is only now applied in some few instances, cut green in the month of August, for making Ashes, which used, before the general Inclosure of the Commons, to be done by the Poor, who sold considerable quantities to the preparers of Vegetable Alkali, or Pot-ash: the Ashes of these and other green Weeds, and of Wood, are collected in the southern parts of this County, and after being moistened with Water, are kneaded into lumps three or four inches diameter, called

*Ass*

*Ass Balls*, which the Housewives here carefully preserve, in a dry place; and when they are going to make Lye for Washing, they do it, by dissolving some of these Balls in Water.

Single stem'd Fern, or Polypody *(polypodium vulgare)*, and Fox-glove *(digitalis purpurea)* are found on heaths and steep banks of sandy soil, and are, with the common Fern above-mentioned, among the most useful indications to the Mineral Surveyor, of silicious strata, where such alternate quickly with argillaceous strata, see Vol. I. p. 162: it should, however, be noted, that the sand falling from the sides of perishing old Grit-stone Walls, is often sufficient to cause these Plants to appear, Fern in particular, tho' the subsoil may be of a different quality, and so will thin coverings of alluvial Sand or sandy Loam, in some other situations.

The improvement of Heath Lands by Paring and Burning and by Liming, will be noticed in Sections II. and III. of the next Chapter: here I would, however, mention, that about Bakewell, some Farmers have first fired the Heath, and then broke up such Lands with the Plough: at Buxton, Mr. Thomas Logan a few years ago, pared a tract of Heath on the Limestone, and after mixing the Turves with Lime in heaps, let them lay in this state until they were sufficiently rotted to admit of spreading, for Turnips. The practices of Mr. John Radford, and Mr. Thomas Pickford, in ploughing Heathy Land without Burning, has been mentioned already, p. 201.

# CHAP. XII.

## IMPROVEMENTS.

ON the general subject of this Chapter: I wish to impress on the minds of Land-owners, the propriety, whether we consider their own interests, that of their families, or their country, of setting apart a sum of money to be expended annually, in effecting permanent agricultural improvements on their Estates; selecting either the Farms of the poorest and most deserving of their Tenants, or those where the greatest expenditure seems wanting, to be first began upon, and to charge an interest on the sums thus expended, in addition to the Rents, as a practice, much to be preferred (as long as any such improvements remain wanting on their Estates) to the expending of every few hundred pounds that they can spare, or even by mortgaging, as many do, to buy up adjoining Estates, and add to the number of acres on their Rent Roll, rather than to the productiveness of what they already possess; since, how much better would it be, to double the productiveness and income from what they already possess, than by doubling the quantity of land, to delay, for perhaps all the remainder of their time, the improvement of any part of it, when they might have fully improved their own, and have had the satisfaction, perhaps, of seeing some other purchaser do the same, by the adjoining Estate that he purchased.

Mr. Robert Cresswell, of Iderich-hay, near Wirksworth,

worth, who practises Draining pretty extensively, informed me, that he is chiefly employed by the Landlords, in consequence of agreements between them and their Tenants; that eight to ten per cent. in different cases, on the Landlord's disbursement, shall be charged, as additional Rent; and that the practice has generally given such satisfaction to both parties, that it is fast increasing. In order to lessen the charge on the Farmers, Mr. C. usually gives them the opportunity of employing their own labourers in opening the tops of drains, and filling them up again, and in as much of the work, wherein no particular skill is required, as they are disposed, or it may suit them to do. I was glad to find Mr. Cresswell's business in this line, so increasing, that he was advertising about two years ago, for two Pupils and Assistants, in superintending such drainages.

Mr. William Cox of Culland, who occupies a large and highly improved Farm, and acts besides as Land Steward to different Gentlemen, expressed to me his opinion, that in most instances, Tenants had better pay six per cent. additional Rent for the Landlord's Money expended in draining, irrigating, liming, or other expensive and permanent improvements on their Farms, than sink their own money, though it were on a 40 years lease, that might so much better be employed in plenty of good Stock, superior Cultivation, artificial Manures, and other improvements, of quicker return to them: and this Gentleman is, of course, a strenuous advocate for this mode of improving Estates, wherever he is consulted.

As an instance of the success of judicious exertions in the improvement of Estates, I am happy in the opportunity of recording, that the late *Joseph Wilkes, Esq.* of whose ability and zeal in improvements, the Board

and

and the Country have often before heard, in conjunction with his two Brothers, in the year 1783, purchased the Measham Estate and part of Hartshorn, for 50,000*l.*; the average Rent of the land in Measham being then 26*s.* per acre, and the number of inhabitants only 200. On the death of Mr. W. a few years ago, land was sold off this Estate to the amount of 20,000*l.*; yet what remains still in possession of his Family, is valued at more than 100,000*l.*; the average rent of the Measham Estate, was in 1809, Three Guineas per acre, and the number of industrious and thriving inhabitants therein, more than 1600! Would that every district in Britain had its Joseph Wilkes*! in which case we need not import Corn, even for our increased population, or be half so dependent on foreign nations as we are.

## SECT. I.—DRAINING.

WHAT has occurred to me, respecting low Land or Fen Draining, has been partly given in Section IV. of the last Chapter, and what remains, as to Embanking, to secure such Lands from River Floods, will, agreeably to the "Plan," be found in the next Chapter. One of the most general and obvious indications of the want of Draining in any piece of Land (not a Bog, the characters of which most people know) is the prevalence of, or disposition to Rushes or Sives (*junci*) of different sorts; the hard and clustered Rushes (*J. inflexus* and *J. conglomeratus*) being most common on strong wet Lands, or such as are usually denominated cold soils, and the Soft Rush

* This Gentleman was the proposer and the first Member of the Smithfield Club, for encouraging the best breeds of Cattle.

(*J. effu-*

*(J. effusus)* is peculiar, I believe, to lighter soils, wherein Springs or perpetual wetness abound: Pert, Pink or Carnation Grasses *(carex's)* of different sorts, and Sedge, hard, as Tussock Grass or Bull-fronts *(aira cæspitosa)* are also commonly found in the same situations. Lands, which without being overflowed by water, become very soft and tender in Winter or in rainy weather, and which acquire much hardness and crack greatly in dry weather, are as certainly in want of Draining, as the above, though the constant or recent use of the Plough, may have prevented the characteristic Plants of such soils from appearing.

Before proceeding to drain any piece of Land, one of the first and most essential considerations should be, whether its wetness proceeds *from Springs* of water oozing slowly out of the Strata, or from Gravel Patches, or not; since if Springs be not the cause of its wetness, but the same should be owing to a solid argillaceous substratum to the vegetable soil, the surface of which is capable of being moistened by wet, and of retaining the same for a considerable time, as above-mentioned, it will be utterly useless to apply, what has by many been called *Mr. Elkington's mode of Draining*, though it were with the perseverance with which that Gentleman sometimes mistakenly applied, *deep* drains and *tapping with an Augur*, where Springs had nothing to do with the wetness of the surface, that he was attempting to drain: this is language which I am aware will sound oddly to those, who have contented themselves with reading the extravagant encomiums bestowed upon the late Mr. Joseph Elkington*, as the discoverer of some new

* Formerly of Princethorp, in Stretton on Dunsmoor, 6 *m.* S W of Coventry in Warwickshire, and afterwards of Birmingham; who died about the year 1806, I believe.

princi-

principles or indications of the existence of Springs, and of their subterraneous courses, and as the most infallible Drainer of Land on those principles, that has ever appeared; which representations, or something like them, are to be found in my predecessor Mr. Thomas Brown's quarto Report on this County, in the reprinted or octavo Reports on the most of the adjacent Counties, which I have read, and in almost every publication on the subject that has appeared, since the Parliamentary Grant made in favour of this Gentleman, in the year 1795: I shall, I trust, however, be excused, where the Board have so particularly desired, under this head of Draining in their "Plan," to have Mr. "Elkington's described," for stating some of what I happen to know, that has not already been published, respecting the success of particular works by Mr. E., as well in consequence of the minute examination which I have recently made of the County of Derby and its environs, as in consequence of the situation which I held in Bedfordshire, under the late Duke of Bedford, for whom Mr. E. expended a larger sum (as I guess, from its having passed through my hands) than for perhaps any other of his numerous employers, in different parts of England: and I consider it the more necessary to do this, from Mr. Thomas Batchelor, the Reporter on Bedfordshire, having thus briefly passed over this important head in his Report, p. 469, viz. "at Prisley-Moor, in the Parish of Flitwick, it is generally understood, that Mr. Elkington's mode of Drainage was tried with very *partial success;*" and he continues, "some have however asserted, that *his directions were not strictly followed;* and others, that his method was incompetent to effect the intended purpose." Which scanty paragraphs being very far, either from a sufficient or a cor-

rect

rect statement of Mr. E.'s proceedings on the Duke of Bedford's Estate; which proceedings it was fully in the power of Mr. B. to have informed himself concerning, by examinations and enquiries on the spots, or by reference to me (with whom he had long been on rather friendly terms), who could and would have been ready, to have shown him plans of Mr. Elkington's several Drains in Woburn-Park, on Speedwell Farm, and on Crawley and Prisley Bogs, with accounts and vouchers for whatever he could desire to know, concerning the expense of Mr. E.'s different operations, as well as respecting their successes, or rather the want of any, that unfortunately distinguished them; as likewise respecting the subsequent Surface-Drainings and Mole-plough Drainings, that were resorted to, some years after, upon the spots where Mr. E.'s deep Drains and Boreings were made, in Woburn-Park and Speedwell Farm: I could likewise have shown him a Plan and Account of the Open Drain or new Brook (but no covered ones) that was executed under my directions, for the Commissioners of Crawley Inclosure, and that laid dry all the useless Brick Drains by Mr. E. on the E and W sides of Crawley Bog (below the Church Road across it); and also, of the covered Drains executed by Mr. William Smith (whose important services to Geology and Mining, have been mentioned, Vol. I. p. 108), some years after Mr. E. had left the Prisley Bog, in a far more unproductive state than he found it; as Mr. Batchelor might easily have satisfied himself (if he did not already know it), by enquiry of Mr. Oliver, resident near the spot, who was the Tenant of Prisley Farm at the time of Mr. E.'s operations, and who some time afterwards, gave his Noble Landlord notice for quitting, and left his Estate, assigning as his principal reason, the injury the

Farm

Farm had sustained, by the Stools of aquatic Woods, and the spontaneous herbage on this Bog having been grubbed up and destroyed, and a great deal of the Peat trenched under Mr. E.'s directions, and a mere black Bog, as wet and more dangerous than ever, being left to him. Such, Reader, was this "partial," or rather, the "negative" success, at Prisley.

But I must descend a little more to particulars. In the Spring of 1794, His Grace sent for Mr. Elkington to Woburn, and consulted him on a very wet and poachy Lawn in his Park, which was particularly disagreeable, as laying between Woburn Abbey, and the Town and new Farm Premises that His Grace was then projecting. Except on the top of the hill near the House Lodge, where the ground had recently been lowered, no part of this land was flat, but it formed a large and regular Hill of clayey soil, extremely tender and retentive in wet seasons, and was as hard and split by cracks, in dry ones: I did not happen to see Mr. E. in his first journey to Woburn, but I well remember His Grace stating to me shortly afterwards, that by *one single Drain*, Mr. E. had undertaken to lay this Land dry, and improve the whole five shillings per acre, besides removing the unsightly Rushes and Sedge, and the tenderness that had so often been complained of: after a time, a Foreman of Mr. E.'s came, named Horley, and began a Bricked Drain from the side of one of the Fish-ponds in the Park, and conducted it northward, nearly on a level at bottom, in the direction that Mr. E. had dug out sods or marks across the slope of the Hill, in such a manner, that after a chain or two in length, it had got six or seven feet deep: he then began to bore 15 feet or more below the bottom of the Drain: and thus he continued, boreing at every pole,

or

or nearly. This Drain laying in my way to the Abbey, I had opportunities of inspecting it every few days, during several months; the work proceeding but very slowly, owing to Horley and two or three men under him, all working *by the day*. The cutting of this Drain, to near a quarter of a mile in length, showed the whole substance of the Hill, to the depth of the boreing at least, to be alluvial blue Clay, mixed with small bolders of hard Chalk, Flint, rounded Quartz, small bolders of Shelly Limestones of various sorts, and here and there very small and unconnected patches of Sand; its composition being just the same as most of the alluvial Hills in this part of *Bedfordshire* (see this article in the Edinburgh Encyclopædia) and exactly similar to a large alluvial patch or hammock, found within the limits of my Map, on the W of Birstal, and N N.W of Leicester, and mentioned Vol. I. p. 20, but omitted by mistake, I find, at page 135, among the Gravel patches. Not a regular stratum of any kind, or a patch of alluvial Sand of any size, occurring in the whole Drain, yet owing to the very loose manner in which the Drain was filled up again with large spits of hard Clay, the rain-water from the slope above, got freely into it, for some weeks, and a considerable stream of water was discharged into the Pond; for displaying of which, Mr. E. caused a hewn stone spout to be placed, at the exit of the Drain; and not a little stress was laid on this *discharge of water*, as a proof that the Drainage was accomplished, but to which I never could assent, suspecting, as really happened, that before long, the Clay would become closer settled, and little effect would be visible, on the *wetness of the surface*, even near the Drain. After considerable rains had fallen, Mr. E.'s attention was called again

to

to this Hill by His Grace; when pleading, that he had a little *mistaken the place of the Spring*, he set out another Drain, 50 or 60 yards* higher up the Hill, nearly parallel to and connecting with the first by a cross branch, and which Horley executed, in like manner to the former one, during the Summer of 1795, and under exactly similar circumstances, except, that in one or two places near the surface, there were local patches of alluvial Sand, larger than had been met with before, and which, it seems, had caused a very slight local tendency to Rushes, and which patches seemed to me to have influenced Mr. E. in setting out this second Drain; for of his *principles* in setting out, or conducting his whole business in Bedfordshire (except, perhaps, at Prisley, to a Committee on his claim for public remuneration) he made a profound *secret:* the results I have hinted at already. Before the middle of the Winter following, the vicinity of this Drain was little better, and the difference of the surface close to the first Drain was not perceptibly different from what it formerly had been, and all the rest of the Hill undoubtedly remained in its former state.

While viewing these Drains, one day, His Grace addressed Mr. E., in my presence, and said, "I have no doubt, Mr. Elkington, but you will succeed with Prisley *Bog*" (which had then been begun on, as I shall mention presently); "but I must have a better specimen than this, that I can show to my friends, of your *upland Draining*; I wish you, therefore, to go round my Farms with my Bailiff Mr. Clayton, and *take plenty of time*, to fix on, and set out deliberately,

* I speak from memory as to distances, depths, &c. not having at this distance of time my Bedfordshire rough Maps and Papers readily accessible.

a piece

a piece of draining, where you are *sure of succeeding*." Mr. E. accordingly fixed soon after, on a flat Pasture Field about ¼*m.* SW of Speedwell-House (now part of a larger one, as I lately observed), rather in a low situation, near the junction of a short wide lateral valley with its principal, near the middle of which Field there was a deep Pond, which had been dug for claying the Sand-hills N of it (about 50 or 60 years before, as I afterwards learnt on enquiry), standing then brimful of Water, but with no discharge from it, more than visibly run into it, from the Furrows of the wet Lands around it, after Rains. Horley's first operation here, under Mr. E.'s direction, was, to begin 200 yards or more below the Pond, and bring up a brick'd Drain to empty it; the cutting of which Drain, displayed only the very same sort of tenacious alluvial Clay, that he had been working in during almost all the preceding year, in the Park: the Pond, heretofore found very useful for the Cattle, being by this means entirely emptied. A Drain was then begun on the south side of its site, and conducted almost level, directly up the easy slope of the Hill in a SSE direction, for 150 yards perhaps, boreing at about every pole distance, in the main as well as in four cross Drains, or "Spouts," as Mr. E. called them, that were made therefrom: the greater part of which were dug six to eight or more feet deep; the whole matter penetrated, to the depth of the boreings, being a uniform mass of this same alluvial Clay, from the surface downwards! The first Winter effectually closed the tops or fillings of these Drains, even to the Rain-water that fell upon them, and the only visible effect, on the return of wet weather next Autumn was, a deep unsightly hole, in place of a useful Cattle-pond! Surely these, as facts, of public notoriety

toriety at Woburn, Mr. B. ought not to have passed over in entire silence, when required to describe Mr. Elkington's Drainages, in his Report on Bedfordshire; nor should I (under like injunctions) appear justified in omitting them, even here, were it only to enforce the primary and indispensable necessity, of ascertaining *whether Springs exist or not*, before taking any steps towards Draining: the want of which previous knowledge, has occasioned the squandering of many hundreds of pounds, in other situations besides Bedfordshire or Derbyshire, that have fallen under my notice, and where much greater evils have accrued to the Public, by delaying and preventing other Drainages in the vicinity, than at Woburn; since the disappointed Land-Owner has but rarely had the discernment and perseverance, of the truly great Man whom Mr. E. served, in this instance, who was heard to say, on repeated occasions, "Since Mr. E. has not drained this piece of Land, I will try what others can do:" and very necessary acts of justice have been withheld, I think, in Mr. B.'s Report, in not mentioning, that Mr. *John Roberts*, from Hertfordshire (now a considerable Timber-merchant, whose Wharf is in Pedlar's Acre, in Lambeth), who had then been extensively, economically, and most successfully employed, since September 1794, in *Surface-draining* most of the clayey Paddocks and inclosed parts of Woburn Park, and elsewhere, during the time that Mr. E. was proceeding as above, was at length directed by His Grace, to set out Drains over every part of the clayey surface of this Close (and all others) in Speedwell Farm, and on part of the Hill in the Park; and that the *Mole-Plough* was successfully used on the remainder, even on and across Mr. E.'s Drains; and by which these pieces of Land

Land are now seen in very improved states: and further, that Mr. *William Hart*, of Little Houghton, near Northampton E S E., who then had been a successful Drainer of Land affected by Springs, *for near forty years*, and had been employed in almost all parts of Northamptonshire*, as well as in numerous other places (even in the place of the nativity and residence of the Beds. Reporter), was employed, to direct one or two Gangs of his Drainers, almost constantly at work, on different parts of His Grace's Estates, from the year 1795 to the time of his decease in March 1802; and as was Mr. *William Smith*, above-mentioned, during more than a year preceding this lamented event; and respecting all of whose highly diversified and scattered Drainages on His Grace's Estates, Mr. B. would not, on minute inspection and enquiry, have been necessitated to talk of "partial" successes. For myself, I know too well the history of the preparation of the Report alluded to, to complain of my Name being omitted among the Practisers of Draining, especially, since I never directed a single *covered Drain* of this kind in Bedfordshire, and could only have been mentioned, as the discoverer, perhaps, of the true principles of *Valley Bogs* (of which very few, if any, perfect instances are to be found in Derbyshire,

* I am enabled to say this, from having been directed by His Grace, in July 1801, to accompany my Brother Benjamin F. (at that time my chief Assistant, and now Surveyor of the Roads leaving London at Whitechapel), in a pretty extensive Tour with Mr. Hart (at His Grace's cost, in time and expenses) in Northamptonshire and parts of Buckinghamshire, to carefully inspect his Drainages, and converse with his several Employers on these Works, respecting their cost, the improvement they had effected, &c. by way of gaining further experience, in the difficult parts of *Spring Draining*, from Mr. H.'s explanations on the spots, and which he most cheerfully and unreservedly gave; and the results of which, as well as of our more extended enquiries, were most gratifying.

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and therefore a reference to the article *Bedfordshire*, in the "Edinburgh Encyclopædia," must here suffice), that have since escaped the sagacious and very able researches of Mr. *John Johnstone*, in his very useful Work on "Draining Land;*" and as one, who was able, so to apply them, in setting out the *Open Drains* in Maulden and Crawley (to which Mr. B. alludes, p. 469), that they appeared to the Commissioners on the respective Inclosures of these Parishes, to be no more than they were *required to do* under the ordinary Clause in such Acts, for improving the public Drains and Brooks of the Parishes: and I might add, tho' attended with less expense than is often incurred in similar instances, they effected wide and lasting improvements, that I can reflect on with pleasure and satisfaction.

Of the other Drains that Mr. Elkington and his Foreman Horley set out and cut, in or near to Woburn Park and in Crawley, I shall say no more here, but proceed to the circumstances of that part of *Prisley Bog*, which Mr. E. himself freely selected out of several others, for his operations, in presence of His Grace and a Committee of Scientific Men, on the 5th of December 1794, and which, tho' in the parish of Flitwick, was scarcely a third of a mile distant (North) of Westoning Church; above which place, the Bog in Prisley Valley is very wide, at the meeting of two principal valleys. Here Mr. E.'s *single drain* was set out, that he undertook, was to drain the Duke's part of the Bog,

* This Work (in 8vo. price 10s. 6d.) no Proprietor of undrained Land ought to be without; and I cannot refrain from mentioning here, the impropriety and *injustice* to its able Author, of quoting and putting it in Catalogues and Advertisements (as I often see it), as "Mr. Elkington's Book on Draining," "Mr Elkington on Draining!" &c.

Bog, at least; the Valley in this place appearing to me, to have been originally much wider and deeper excavated, in the great Woburn-Sand stratum (Vol. I. p. 112) than it is at present; owing to a very thick deposit of alluvial Clay (scarcely at all differing from that at Woburn, p. 367) that is lodged from the Farm-house downwards, on the north side of the Valley, rather flat on its top, and forming a range of very wet and cold Arable Fields; yet so remarkably were they covered in some parts with rounded Quartz Pebbles, as large as Hens and Ducks Eggs, that a cursory observer might have supposed considerable patches in these Fields to be mere Gravel underneath: on the edge of the Bog against this Clay patch, the Water had (in common with Valley Bogs wherever I have observed them) exactly the appearance of springing from, or coming out of this Hill (of Clay), that rose by an easy slope, perhaps 10 or 15 feet above the surface of the Bog; the Peat being here the wettest, and pretty uniformly higher than it was some yards southward, within the Bog, and most of the thriving aquatics were found in this elevated margin to the Bog. A crooked old Hedge grew along the edge of this Clay patch, that Mr. E. suggested to His Grace and the Committee, might with advantage be grubbed up, and his new open Drain, become a much handsomer and more proper division of the Arable and Meadow Land, in future: this being assented to, Mr. E. proceeded to stake out, first a cut from the Brook, across the level Bog to the edge of the Clay slope, joining its stream with an obtuse instead of an acute angle, in order that it might *line* with a Ditch, in the adjoining Proprietor's Land in Westoning, and then several connected straight lines, each as far as they could be carried, so as not to de-

viate materially from the very edge of the Bog: in this operation Mr. E. was left entirely to himself, except, by the Labourers who drove Stakes by his direction, the Committee, His Grace, and myself, standing on the Hill or at a distance, viewing his operations; which done, Mr. E. was asked by His Grace, whether it would make any difference, if this Cut was performed *by measure*, under the direction of his own Agent*, according to dimensions and directions for every part in writing, to be then furnished? "Not any," Mr. E. replied; and immediately stated the exact width at top and at bottom, and depth at each of his stakes, that the Drain was to be cut, and how he wished the excavated stuff disposed of, in making up the edges of the Drain on either side, where the surface was lower than usual, and the remainder to be wheeled into old Turf-pits and low places on the Bog: all which being committed to writing, by one of the Committee, the Paper was handed to me, to see its directions carried into effect; and which was strictly and *most faithfully* performed. Nearly the whole of the cutting, after the cross Cut was done, proved to be alluvial Clay, with occasional Quartz and other Pebbles, and a slight scatter of sandy Gravel on its top, as already hinted, with little or no Water, but what oozed over or thro' the south side of the Drain, from the Bog, which still, nevertheless, continued as wet as ever, to the very edge of this Drain, though about five feet deep: the other or land-side, got dry almost immediately, where any of the bog or wet ground happened to be cut off by it.

* His Grace was influenced in making this proposal, by having noticed the very slow progress, and great expense, of the Drains performed by Mr. E.'s *Day-Men* in his Park, and by wishing not to suspend the progress of those Drains.

Mr.

Mr. Elkington was apprised by letter, of the Cut being completed, and soon after came to Woburn, and took Horley and his boreing-apparatus with him to Prisley, where, after viewing the Cut, he and his Foreman, expressed themselves well satisfied with its execution; and Mr. E. directed and staid to see, several deep holes bored in its bottom, *in solid Clay*, like its sides: and this boreing at little more than a pole distant, Horley afterwards continued, through all the length of the Cut, full a quarter of a mile I think; and then, finding but little increase of water in the Drain, and the Bog on the very edge of the Drain to continue as wet as ever, he went through the Cut again, and *sunk holes*, about four feet long and two feet wide, and as deep as he could throw out the hard Clay that he dug or picked from them, and then set his Labourers, to gather pebbles from the ploughed lands adjoining, to fill up these great holes with; yet all was to no purpose, *no Spring or Stratum capable of conveying one*, was cut or pierced in all this length of open cut, and of boreing and sinking! The subsequent operations are shortly glanced at, in Mr. William Smith's "Observations on Water-meadows," p. 95, &c. and are the less proper for me to detail, here at least, as I saw no more of them than my absolute duty required; being, as I trust every one ought in such circumstances to be, much disgusted, at such evident squander of my noble Employer's money. After some years, a large octavo Volume appeared (from the pen of a person whom I shall not disturb in his merited exile and oblivion), which was industriously circulated in Bedfordshire, particularly in the Market Town where the Bedfordshire Reporter frequents, I believe, and of course he must have seen it, I presume (and as it is yet on sale

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in some Book Shops), designed as a general attack on the Secretary to the Board of Agriculture, and on its Members and Proceedings; and among other fit subjects, the writer pretends to advocate the cause of Mr. Elkington, *as an injured man!* (but without Mr. E.'s knowledge or privity, I feel confident), and roundly asserts, that the Drainage of Prisley Bog failed, through Mr. Farey having altered the place of the Drain that Mr. E. staked out!, than which nothing could be more untrue, as I have stated, and for which assertion, I can with confidence refer to Sir Joseph Banks, and all those living who were on the Committee, and saw the Cut after it was made, or to those at Woburn or Prisley, who heard and saw what Mr. E. or his man said and did, on taking charge of the Cut in question, and ever after, while they continued in the County.

Mr. Batchelor's words, in the quotation in page 364, by which I began this long digression, bear too evident an allusion to these slanders, to allow of my passing by this opportunity of refuting them, and for which, I trust, that the Reader will excuse me.

A diligent enquiry, while I was on my Derbyshire Survey, procured me information, of but *two* Gentlemen in the County, that employed Mr. Elkington to drain, Francis N. C. Mundy, Esq. at Markeaton, about the year 1794 or 1795, and the late Job Hart Price Clarke, Esq. at Sutton in Scarsdale, a year or two later. Mr. Mundy's account to me was, that the Leicestershire Graziers early employed Mr. E. and praised him highly; he came to Markeaton Park, and set out two Drains, on the slope of the Red Marl Hill S of the Hall, that were made seven or eight feet deep, and bored, in search of *marl leakages*, as Mr. E. termed the Springs in these beds of Marl-stone, that he *expected to meet with*, *but*

*did*

*did not*, and these Drains failed entirely. Mr. M. afterwards had Stone Drains laid, at two to two and a quarter feet deep, on the wet parts of this Hill, and effectually cured them: two other Drains which Mr. E. set out, in the gravelly flat in the Valley W of the Hall, took effect: on viewing these Drains, I noticed, however, that the one which *points* to Mackworth Steeple, had Rushes growing above it in plenty, at the edge of the Gravel.

In the N E part of Sutton-Park, on Coal-measures, Mr. Elkington set out and superintended some Drains, for the late Mr. Clarke; which not answering the intended purpose of rendering the land dry (as Mr. W. B. Thomas of Chesterfield has informed me), and his charges also being thought extravagant, on these two grounds Mr. C. resisted the payment of Mr. E.'s demand, on account of the above work, and the Cause came on to be tried at the Assizes at Derby, but was, on the recommendation of the Judge, referred to a Barrister. The late Mr. William Spear of Gray's-Inn, was the Attorney for Mr. Clarke in this Cause, at whose Chambers I have called, in hopes of seeing, from the Brief prepared for the Trial, more precisely the merits of this case, and of learning the issue; but his Successors, Messrs. Cardale and Young, were unable to find the Brief, or assist me herein; and I have only been able further to learn (through a friend) from Mr. Hodgkinson of Sutton, who was Mr. Clarke's Agent at the time, that Mr. Elkington emptied a deep Pond in the Park, in order to lay his Drains into the hole, made several deep Drains, and bored and sunk Wells in them, "without any benefit to the surface," and yet his charges were, near 400*l*. for labour, and near the same sum for his own skill and attendances! I lament, that

that I heard nothing of this instance of Mr. E.'s operations, till long after I had left the neighbourhood of Sutton, or I would have procured a more satisfactory account, particularly as to *the soil, and cause of the wetness* intended to be remedied, than I have since been able to obtain.

In the considerable spaces of the adjoining Counties that I went over, I saw or heard of no others of Mr. E.'s Drainages, except from Mr. Joseph Chell, of Overseal, who told me, that he was employed at Fisherwick-Park, Staffordshire, and failed there: fortunately, not one of the eleven other *professional Drainers* in Derbyshire, whom I shall have occasion to mention herein, or even any of its *Amateurs* in the Art, have, I believe, experienced similar *bad luck* with their Drains.

Nothing is more common among Farmers in some Districts, than to hear of "Wall Springs," or such as they suppose to rise perpendicularly, from a great depth in the earth, just *in particular spots*, through some weak parts of the Strata, as some have expressed themselves: but since I have turned my attention to all the circumstances of the Strata, and of Faults or the Fissures or Breaks therein, as well as to the alluvial Patches on the Strata, I have never seen a single instance of a Spring rising *only in one place*, except by the assistance of Art, as in a Well, or Bore-hole, and I think, that the very name of *Wall* Springs, refers them to the *line of Springs* (generally straight, or near it) which will be seen breaking out by the side of many *Faults*, that present nearly vertical planes or walls of water-tight Fault-stuff (see Vol. I. p. 500 and 501), and are so common in some Coal Districts, with which practical Colliers are so well acquainted. See Mr. John Bailey's Durham Report, p. 30.

Nothing

Nothing can exceed the disgusting quackery, or the mischievousness of those, pretenders to the difficult *Art of Draining*, who, walking into a wet piece of ground or a bog, without much hesitation, fix themselves, and begin to caper on some particular spot, exclaiming, "Here is the centre of the Spring!" "Here is the Spring head!" "Here lies the source of the mischief!" "Here rises the Spring which occasions the bog!" &c. &c. which I have often been doomed to see and hear; as well as have experienced the delight, of seeing the operations of Drainers, who, after carefully inspecting the surface of a wet piece of ground, on which their art in Spring Draining was to be exercised, next taking a more extended view of the adjoining Lands, particularly such as appear wet, or show marks of Draining having been performed, enquiring if necessary, into the history of such, from the Occupiers of the Lands, with a view of tracing or discovering a straight line of wet places crossing the inequalities of the ground, without being much influenced by them, as indications of a *Fault*, whose Clay Wall holds up the water in the Strata on one side of it, and forces it to flow over all the lower places of its top; or, to trace a crooked or serpentine line of Springs, that can be referred, either to the lower edge of some *porous stratum* or Gravel or Sand Patch, resting on one less so, or *water-tight*, which bassets on the side of a Hill, and over which retentive stratum it flows, in all the lower places of its edge; or, to the upper edge of some *water-tight* stratum or alluvial Patch, that laps against a porous stratum, and pens the water in it, until it flows over the lower parts in its edge: if none of these appear, but an isolated Bog or Moss presents itself, the next attention of such have been to discover, whether

whether some of its parts or edges are not higher, and its aquatic plants growing more vigorously, than others, and to infer from thence, the way and manner in which moisture is supplied to the Bog (which, as I have often before observed in these Volumes, may almost be presumed to rest on Sandy, rather than on very Clayey matters), which, if in the bottom of a Dale, or constituting a *Valley-bog*, the depth and increasing solidity of its Peat, as we penetrate it with an Augur, may show the reason why water, which in the original state of the Valley, quietly oozed into the Brook or Rivulet in its bottom, out of porous Strata, has progressively been forced to rise in such Strata, and flow on to, and invigorate the edges of the Peat; while, in some rare cases, the Peat has remained spongy and pervious to water in particular spots, and through which *weak parts*, not of Strata, or even alluvial Soil*, but of the

* It is not meant here to contend, that the uppermost Stratum or Patch of clayey matter, is not sometimes so nearly excavated through, by Valleys and Denudations, that water bursts through it from the porous Stratum immediately below it; but to combat the idea, of crater-like holes or local perforations, whether open or filled with porous matter, that let up water from mysterious sources at great or unknown depths in the Earth, that has been the fruitful source of so much erroneous writing, and of still more mischievous quackery, of late years, in Tapping and very deep Drain-cutting, for such Springs; still less is it meant to deny, that in most situations, there are porous Strata charged with pent or constrained water beneath the surface, and often at very great depths, which would rise greatly, if perforated by a Well or Bore-hole; but I contend only, that all such water-charged Strata are, or may be known, and can be shown to connect *with the surface*, where they receive their water, at as great or a higher level than the same would so rise, on gaining a new or partial vent: and on the subject of deep *Wells* (whereon I am often consulted professionally), I even hold it as a maxim, almost infallibly deducible from the known stratified structure of the earth, that in any

the Peat, the water breaks up, and supplies constant moisture to the surrounding surface of the Bog, and occasions, in time, a peaty knowl or bump thereon.

Contrary to the empirical presumption of some, who have set out expensive Drains (to be executed at the cost of others) from a mere view of the Surface, by either sticking down a few Pegs, or turning up a Sod here and there, as directions to the Workmen, without the use of a Spirit-level or any other instrument: the cautious and scientific Practitioner, after all the lights that Theory can throw on the case, have been obtained as above, will, after roughly staking out the most feasible course for his Drains (levels considered), cause several *trial-holes* to be sunk in or near to the line of them, as deep as his Drains are thought necessary to be (if practicable for Water, and bore where it is not), both to satisfy himself and the Labourers, of the kind of cutting, and the difficulties likely to be met with, that should always regulate the prices per rod or yard, that the work should be *let** at, after the Lines have been definitively settled, and the depth in different parts regulated, by the use of a good Level (where necessary);

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any *low situation*, where a great depth of clays can be penetrated without meeting Springs (or bad ones only in their intervening Strata), that plenty of good water may be obtained, and perpetually flow over the surface of its own accord, as in all the Vale of London; or even so rise, very high in buildings in some situations, as at Boston, and numerous other places in the Fens, might doubtless be shown. If, unfortunately, natural perforations through the Strata had been as common as some have asserted, man could never have known the benefits of this triumph in the art of tapping Springs.

* It is hoped, that no Professional Drainers now stipulate with their Employers, that their working Foreman shall have a Gang of Men under him, all working at very high *day wages*, and to be besides supplied with large potions of strong *Ale* from their Cellars!

and

and not unfrequently, the unexpected appearances of the soil or strata exhibited in such trial-holes, or the quantity and manner in which Water enters from the sides or bottoms of those holes while sinking, will induce a material alteration, or an entire change, in the principle of proceeding; a degree of deference to experiment and practical trial, which no genuine Artist will see derogatory in the least to his theoretic skill or experience, and which no Employer ought to wonder at, or in the least grudge him the time required, for repeating his operations, as often as may be necessary, both for saving expense and ensuring success in his projected improvements; not to mention the great public good or great harm that he may do, by way of example, according as his success is economic, and perfect or otherwise.

In entering thus far into the principles and practice of setting out Drains, I have no intention of recommending Farmers, or even Gentlemen or their Agents, perhaps, to attempt the execution of the same by their ordinary Labourers, or even of recommending the setting out of the work to be attempted by themselves, convinced as I am, that the theory and practice of this Art, are both so very complicated and difficult, that very few would become tolerable masters of either, before they had drained their own Farms or Estates, and their dear-bought knowledge would be of no further use to them; and what blunders, and injuries to the cause of improvement, may they not in the mean time commit? which a liberal encouragement to Professors and undertakers of the work, might have avoided, with signal benefit to themselves, in most cases.

Labourers are a long time before they become expert, in working with effect in a deep Drain, unless unnecessarily

sarily widened to make them room; or at throwing the stuff over their heads often, to fill up the Drain after them, instead of loading the sides with it, to be again removed, and to endanger, by its weight, and their treading, the slipping, caveing, or colting in of the Drain: before they know well on which side, and how near to lay their soil from the Drain, what appearances indicate the necessity of strutting the sides, how to proceed when slips have happened, or quicksands, or very soft matters occur, where boreing should be had recourse to, how deep, and how to perform it readily: before they become expert and expeditious in laying the Bricks, Tiles, Stones, Wood, &c. in their Drains, in a safe, durable, and cheap manner, and of covering them properly, &c. &c. And such Men, when trained and experienced, will make no difficulties of travelling to distant places (for a fixed sum per mile, to include wages and expenses), and of getting lodgings and provisions, at new places, from knowing how to go about procuring such, while they are executing the work *by contract*, under a Professional Master.

I think, that few things would tend more to improve and promote the draining of Land, than were *Premiums* to be offered by the Board of Agriculture and the Provincial Societies, not to the Owners or Occupiers of Lands drained, as heretofore, but to Professional Drainers and Undertakers of such works by Contract: for instance, a Premium for the greatest number of acres effectually drained, for one or more Proprietors, in a given time, according to Certificates from the Owners and Occupiers of the Lands and proper Witnesses; another to the Professional Drainer employed by the greatest number of Land-owners or Farmers, on effectual Drainages, however small, within a given time: a portion

portion of the Premium in each case to go to the Labourers actually employed, if they worked by measure or bargain: which would encourage and increase this most useful body of Men.

I am very happy, in being able to mention so many *Professional Drainers*, or undertakers of such works, with the places where they have been employed in Derbyshire, as follows, viz.

Mr. James Alsop of Kirk Ireton, near Wirksworth SSW.

Mr. Joseph Chell of Overseal near Ashby-de-la-Zouch, Leicestershire S W;—has drained at Burrow-Fields, Catton, Chilcote, Croxall, Edingale, Littleover, Lullington, Newton-Solney, Roslerston, &c.

Mr. Robert Cresswell of Iderich-hay, near Wirksworth S.—at Alderwasley, Alton in Wirksworth, Hulland Ward, Iderich-hay, Turnditch, Wirksworth, Wyaston, &c.

Mr. William Hardy of Breaston, near Derby SE, (late of Kegworth).—at Risley, Sandiacre, Wilsthorpe, &c.

Mr. John Johnson of Union Lodge, near Ashby-de-la-Zouch, Leicestershire S W.—at Ashby Wolds, Leic. Measham, &c.

Messrs. William and Thomas Litherland of Appleby, near Ashby-de-la-Zouch, Leic. S W.

Mr. Edward Manlove, at Henry Smith's, Esq. of Norris-Hill near Ashby-de-la-Zouch, Leicestershire W.

The late John Mather of Mackworth;—at Foremarke, &c.

Mr. John Potter of Mackworth, near Derby W.—at

at Aston on Trent, Barrow on Trent, Chaddesden, Coxbench, Donisthorpe, Intake, Mackworth, Markeaton, Radburne, Repton, Swarkestone, Wessington, &c.

Mr. Thomas Rushton of Chilcote, near Measham S W.—at Lullington.

Mr. John Samples of Belton, near Loughborough, Leicestershire N W.—at Burrowash, Dale-Abbey, Draycot, Hopwell, Locko-Park, Risley, Sandiacre, Spondon, Stanton by Dale, Wilsthorpe, &c.

Mr. John Swift of Hather-Turn, near Loughborough N N W.—at Risley, Sandiacre, &c.

In conversation with some of these Drainers, I noted as follows:

Mr. Robert Cresswell informed me, that he employs 9 or 12 Men in draining; engages them for half a year certain, at 20*s*. or 21*s*. per week from Lady-day to Michaelmas, and 17*s*. or 18s. the other half year; works them in Gangs of three each; and usually undertakes the draining at prices per rood (of seven yards), varying according to depth and circumstances, viz. three feet deep at 3*s*. to 5*s*. per rood, four feet drains 5*s*. to 6*s*., six feet drains 7*s*. to 9*s*. for labour only; the Employer finding Stones, Bricks, or Tiles, and Cartage. This Gentleman also since furnished me with a very particular plan and account of a Drainage which he effected for Francis Hurt, Esq. at Alderwasley.

Mr. John Potter has practised Draining since the year 1786; employs 5 to 20 Men, principally in deep or Spring-draining: sometimes he undertakes jobs at certain sums of Money, but more commonly is paid by the rod (of 7 yards), viz. for three-feet Drains 7*d*. to 12*d*. per rod, four feet Drains 20*d*. to 3*s*., five feet Drains 2*s*. 6*d*.

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to 4*s*., six feet Drains 3*s*. to 5*s*., seven feet Drains 5*s*. to 7*s*., eight feet Drains 6*s*. to 8*s*.: sometimes he has cut parts of a Drain twelve feet deep, and agreed for it at 8*s*. In the three-feet Drains he sometimes uses Turves only; unless Stone is good and near at hand; Draining-Tiles (see Vol. I. p. 453) are found the cheapest and best: uses a one to two and a half inch Augur, according to the quantity of Water which he expects to tap.

Mr. John Samples, has been a Drainer since 1788, the first four years and a half of which period, he worked under Mr. Elkington; has of late years had 14 to 40 Men under him; usually undertakes his Drains at per yard, according to depths, viz. three feet Drains 2½*d*. to 5*d*., average 4*d*. perhaps; four feet Drains 5*d*. to 9*d*., average 7*d*.; five feet Drains 8*d*. to 12*d*., average 10*d*.; six feet Drains 12*d*. to 18*d*., average 15*d*.; seven feet Drains 18*d*.; eight feet Drains 21*d*.; nine feet 24*d*.; and increase 3*d*. per foot if deeper: the Employer finding and bringing Stones, Bricks, Pipe-bricks, or Tiles, and the use of Planks and Stretchers to keep up the sides of deep Drains, or in bad ground.

I will now proceed to mention, in order, the places where, and on whose Estates or Farms, I saw or had accounts, of this first of all Agricultural Improvements, *Draining*, viz.

Alderwasley (on the Estate of Francis Hurt, Esq.), done under Cresswell; 30 acres of very difficult ground; cost 203*l*.

Alton in Wirksworth (the late Mr. Francis Bruckfield), cost 4*s*. 6*d*. per rood, under Cresswell.

Ash in Sutton (Mr. Richard Harrison); deep Drains, laid with Pipe-Bricks. Boreing in the Skerries, or thin Marl-stone beds in the Red Marl here, has effected a very great improvement.

Ashover

Ashover (Mr. John Milnes, on Greenhouse Farm).

Aston on Trent (Rev. Nathaniel P. Johnson), under Potter.

Barrow on Trent (Messrs. John and Robert Porter, Wm. Sales, and John and Joseph Sharp), under Potter.

Barton Blount (Francis Bradshaw, Esq. and Mr. John Webb, at the Lodge).

Blackwall (Mr. John Blackwall), see Vol. I. p. 496; on Mr. B.'s Farm (which has been 500 years in the family), he was the first that adopted deep Drains in these parts; has laid some 12 and 15 feet deep, and more than 7000 yards, more than 10½ feet deep! has effectually drained 300 acres that was before wet and unprofitable: he has not much used the Augur, except for proving the measures, but opened holes below his Drains occasionally, with an Iron Bar (as Mr. Elkington at first did), having found the Drains to sink across or very near where the Augur had been used.

Bolsover (Rev. Edward Otter); the Skeletons of Cattle, twice found in the Drains, in the boggy Mires occasioned by the Springs from the Grit-stone Rocks across Mr. O.'s Farm, showed, that these parts were not merely useless, but fatal to Animals: now the Land is dry, and Water-troughs in his Yards are excellently supplied from these Springs.

Boythorp (Wooton Berkenshaw Thomas, Esq.); in the year 1811, after the discontinuance of the pumping, and the filling up of the Shafts at Boythorp Colliery, on account of the superabundance of Water in these Coal-Pits, two Fields of Mr. Thomas's, laying east of the Engines, that always had been too wet, became much worse, until they were effec-

tually drained, and made sound Land, by Under-drains, of no great depth, in a ratchel or loosened part of the 10th Rock, under yellow alluvial Clay.

Bradby Park (Earl Chesterfield); in the years 1800 to 1806 inclusive, his Lordship, by his very able Agent Mr. Francis Blaikie, laid 34,690 yards run, of covered Drains, formed of Stone, Brick, and Turf, deep and shallow included, at the cost of 592*l.* in the whole, or more than 4*d.* per yard on the average: some were laid 14 feet deep: the improvement has been most striking, the usual Herbage of Pastures naturally sound, has succeeded to Rushes, Sedge, and Sloughs! In Surface-draining with a Turf reversed, Mr. Blaikie prefers cutting his Drains with sides inclining towards each other (like a Wedge) to the bottom, to the leaving shoulders to support the Turf (in the Hertfordshire method), finding in such, the Turf very liable to bend down in the middle and let in the Mould, so as to choak the Drain.

Brailsford (Mr. Edward S. Cox), has drained the whole of his Springs, but not attempted Surface-draining.

Brassington (Mr. George Toplis), see I. p. 496.

Burrowash (Mr. Francis Agard, Mr. Swindale), under Samples.

Burrow-hill (Mr. Robert Lea, at the Fields), under Chell.

Calke (Sir Henry Crewe, Bart.): this I saw, excellently well conducted, under his Agent Mr. William Smith, S of the Park.

Catton (Eusebius Horton, Esq. and Mr. Matthew Webb, at Donkil Pits), under Chell; who finding the Augur-holes and Drain-bottoms made for Mr. Horton in a *Quick-sand*, to blow up and fail, sunk Brick'd Wells, eight feet deep in the Quick-sand, by

by means of sinking Curbs, which have since conducted the powerful Springs confined under this alluvial flat, up into the covered Drains about three feet deep, that convey them away.

Chaddesden (Sir Robert Wilmot, Bart.), under Potter.

Chilcote (Mr. John Bagster, Messrs. Benjamin and William Mousley, and several others), under Chell.

Church Sterndale W (Mr. Joseph Gould).

Coxbench (Mr. John Slater), under Potter.

Croxall (Thomas Princep, Esq. for Mr. William Jarman, at Persal Pits), under Chell.

Culland (Mr. William Cox).

Dale-Abbey (Mr. Robert Boot, Mr. T. Hill Cox, Mr. Stevens, and Mr. John Winfield), under Samples.

Darley (Mr. George Barker).

Derby (The Rev. T. Gisborne): it appears from a Note in p. 112 of Mr. William Pitt's Staffordshire Report, that "many years" prior to 1795, "a labouring Man," who had been a Miner in the Peak, thoroughly drained an obstinately wet piece of Land near Derby, by a new method, that of *boreing deep with an Augur*, in the bottom of his Drains; and that he afterwards repeated the same with like success, on a piece of Land near that Town, for Mr. Gisborne and under his inspection, and who has continued ever since to practise it in consequence. I regret exceedingly, that the Name of this ingenious, and perhaps *original Drainer by Tapping*, has been kept back, and that I have been unable to obtain further information concerning him, not happening to have read the passage alluded to, till since my return from Derbyshire.

Donisthorpe (Mr. William Sale), under Potter.

Doveridge (Lord Waterpark).

Draycot (Messrs. Thomas Boworth, William Clayton, Tant Gretton, Robert and Thomas Jowett, John Lancashire, — Records, Joseph Trowel, &c.), under Samples.

Edingdale (Mr. Thomas Simkin), under Chell.

Fenny-Bentley (Mr. John Blackwell, ¼m. S of Woodeaves Mills).

Foremarke (Mr. John Pearsall, Mr. William Smith, at the Park): Mr. Pearsall's first Drains were made under the late Mr. John Mather, some of them ten feet deep; since this he has conducted his own Draining, to the amount of 500*l.* in the whole, principally in Gravel.

Great Hucklow (Mr. John Radford): this Draining was in new Allotments from the Common, principally in boggy places from Springs, issuing from Shale-grit beds, five to ten feet deep, by which Mr. R. lately states the value of his Land to be doubled, and that several of his Neighbours are following his plan of proceeding.

Hales-green (Mr. John Bainbrigge): the value of seven acres was hereby increased, Mr. B. says, from 5*s.* to 5*l.*

Hardwick (the Duke of Devonshire): Shallow, or Surface-draining, on Coal-shale W of the Hall, under Mr. John Cottingham, His Grace's Bailiff.

Hopwell (Mr. William Botham, and Thomas Pares, Esq.), under Samples.

Hulland Ward (Lord Scarsdale), under Cresswell, and (for several) under Potter.

Iderich-hay (Mr. Robert Cresswell) on the Farm he occupies.

Ilkeston (Mr. Samuel Cocker): some of his Drains were deep and bored, in low Lands by the Nutbrook.

Intake

Intake in Hulland (——): for seven years (since 1790) 100*l.* per annum were expended in Draining here, under Potter.

Kniveton (Rev. William Hurd): a Drain here, 30 yards in length, on cutting thro' a Shale bed, drained an acre of very wet Land, and laid dry a Spring at a distance, that never failed before.

Littleover (John Peel, Esq.), under Chell.

Locko Park (William D. Lowe, Esq.), under Samples.

Longford (Edward Coke, Esq.): in the Meadows, which had improperly been watered, without this necessary and previous step. See Sect. IV. of this Chapter.

Lullington (Mr. Thomas Moore), under Rushton—(the late Christopher Simmonds), under Chell.

Markeaton (Francis N. C. Mundy, Esq. and Mr. Richard Leaper, at Rowditch), under Potter: Mr. Mundy, on the recommendation of T. B. Bailey, Esq. of Hope in Lancashire (see Mr. John Holt's Report, p. 107) several years ago tried Turves or Sods for Surface-draining*, 16 inches deep, which answered for a long time, and have since been replaced with permanent Stone Drains. The Ditches about Derby are generally neglected, Mr. M. observed, which if deepened, and a few Spouts or covered Drains laid into them, farther Draining would be unnecessary.

* Mr. George Nuttall of Matlock, informed me, that a Drain a foot wide and deep, is usually taken out with a Spade, and in the bottom of this a narrow tapering Spade is used to cut ten inches deeper; after which the Sod is carefully reversed on the shoulders of this Drain, to leave the lower Drain hollow; and that in different parts of the County, this costs 8*d.* or 9*d.* per rood of seven yards: where Rubble or Gravel-stones are plenty, the lower Drain is often filled with them, and part of the upper Drain also, on Arable Lands.

Mr. Elkington's Draining for this Gentleman has already been mentioned, p. 376.

Matlock Bank (Mr. John Nuttall and Mr. Adam Wolley): these Drains were set out and superintended by Mr. George Nuttall, and most capital improvements effected thereby: Mr, W. had however quickly after, the mortification to see his valuable Close entered on, and treated as the vilest Waste or useless Common in England would have been, by persons, in search of a Vein (which they never found), under the sanction of the Gothic and inapplicable Mining Laws or Customs (see Vol. I. p. 356), which on all accounts need speedy revision and correction, or entire abolition.

Measham (the late Joseph Wilkes, Esq.), part under Johnson: this Draining was among the most operative of the causes, of such an astonishing improvement of Mr. W.'s Estate, as is mentioned, page 361.

Newton-Solney (Abraham Hoskins, Esq.): in the early parts of Mr. H.'s Draining, he employed Chell to set out and let the work; latterly he did these himself, and has highly improved 150 acres of strong Red Marl, the water from which supplies his new Fish-ponds and House, most excellently.

Norbrigs (Mr. Joseph Butler): this Gentleman, at once improved the Lands in his own and others occupation, and his Colliery beneath them likewise, see Vol. I. p. 351.

Northedge (Mr. Roger Wall).

Perry-foot (Mr. Robert Needham): this Draining has much improved the cold Shale on Rushop Edge, and the water is discharged into the line of Swallow-holes by the great Fault, mentioned, Vol. I. p. 288.

Pilsbury (Mr. Joseph Gould); this Gentleman has success-

successfully drained his Meadows here on Shale, belonging to the Duke of Devonshire, and his own Farm at Low-end in Sheen, Staffordshire (near Ecton); where the cutting of a Shale-grit Stratum cured much boggy Land, and laid dry several of the Cottage Wells around, until sunk deeper than formerly. The extensive knowledge of Mr. G. in this and other branches of rural improvement, have been found highly beneficial in several Parishes, where he has been a Commissioner for their Inclosure, as well as his advice and assistance hereon, among the circle of his friends, but not further I believe, in Derbyshire, or I would gladly have included his Name among its Professional Drainers.

Radburne (Mr. Samuel Eyre, and Sacheverel C. Pole, Esq.) Mr. Pole's Draining was done under Potter, who says, that for the use of an acre of Land for two years, he undertook to drain more than 100 acres near Radburne Hall, under which there were 36 feet of Peat and soft Clay or silt, in some places, and the Herbage of which was so coarse, that it was usually mowed to pack China and other uses, to save Straw.

Repton (Mr. William Pearsall), under Potter.

Risley (Messrs. Joseph Cocker and William Hodgkinson), under Hardy.

(Messrs. Joseph Cocker, Rev. J. H. Hall, and William Hodgkinson), under Samples.

(Messrs. James Briggs, and Rev. J. H. Hall), under Swift.

Rosleston (the late Mr. Joseph Kinnersley), under Chell.

Rushop-edge (the Duke of Devonshire for his Tenants).

Sandiacre (Messrs. John Stevens and John Thrave), under Hardy.

Sandi-

Sandiacre (Messrs. Robert Thrave, and Rev. Mr. Wilkinson), under Samples.

(Messrs. William Hickinbottom, and John Stevens), under Swift.

Smalley (Mr. John Radford): a brown Soil, about three inches thick, covering a blue and white Clay substratum here, has required Surface Drains at seven to ten yards distance, for its improvement: these Mr. R. sunk 28 to 34 inches deep; the lowest 16 or 18 inches of which was formed, by a strong narrow Spade six inches wide at top, and three at bottom: the filling up, to within six inches of the top, was with small or rubble Stones, on which the Sod was either reversed, or a little Straw was carefully spread, before the Arable Soil was filled in; and which kind of Drains, Mr. R. has successfully introduced in all similar Soils.

Spondon (Messrs. — Cade, Robert Hancocks, Captain Oldham, and Joseph Osborne), under Samples.

Stanage in Wingerworth (Mr. Thomas Clayton).

Stanesby (Edward S. W. Sitwell, Esq.)

Stanton by Dale (Messrs. William Dore, Joseph Scattergood, and William Warner), under Samples.

Sutton in Scarsdale (the late Job Hart Price Clarke, Esq.), under Mr. Elkington, as mentioned, page 377.

Swarkestone (Messrs. Thomas Austin, Thomas Henshaw), under Potter.

Temple Normanton (Mr. Joseph Butler, at Lings, for the preservation of his Colliery, &c. See Vol. I. p. 351.

Tibshelf (Mr. Benjamin Chambers, at Hurst) near Nottinghamshire. See Mr. R. Lowe's Report, p. 101.

Turnditch (Mr. Samuel Milnes), under Cresswell.

Waldley (Mr. Thomas Bowyer).

Wes-

Wessington (Sir Robert Wilmot, Bart., at Road Nook), under Potter.

Wilsthorpe (Mr. Thomas Bosworth), under Hardy.
(Messrs. Thomas Bosworth, and Robert Jowett), under Samples.

Wirksworth (Mr. Robert Simpson), under Cresswell.

Wyaston (Rev. William Evans), under Cresswell.

Such a noble List of Improvers by Draining, and which must be regarded as far from complete (though as much so as I can make it), in a County represented by many, as very backward in improvement, ought I think to stimulate some other Counties, where it is equally or more wanted, to emulate the good example of the Derbyshire Drainers and Farmers.

It has appeared to me, that *deep* Drains have been resorted to rather oftener than necessary, with a different disposition of them; and that many, in relating the accounts of these improvements, by themselves and others, seemed to ascribe more of the merit to this circumstance than was due: since the only rule of merit in Draining, is *laying the land permanently dry at the least expense.* No considerable use is now made of Turf or Wood, in Draining; and considering how plentiful Stone is in most parts, and Clay for Brick, and Tiles, with Fuel cheap, in the others, they ought, I think, to be entirely disused here: and the highly impolitic Tax on Bricks and Tiles used in Draining, taken off, or remitted, to encourage it, as observed Vol. I. p. 455: as the Law stands, I think that the Farmers have as good a right to make *coffin-shaped Bricks*, for Draining their Lands, as the Trustees of Turnpike-roads have to make such, for repairing Roads, as is largely practised, I lately saw, at Featherstone Common,

mon, and other places near Pontefract in Yorkshire, without the obnoxious charges of an Exciseman. Bricks of this sort, well moulded with two parallel or equally inclined faces, and well burnt, would be equally strong and applicable in Draining, at least for building the sides of Drains, as common Bricks: while the ragged Bricks recommended for these purposes in the Lancashire Report, p. 109, would be very difficult to make, very liable to accidents, as well as to let sand and earth into the Drain.

After draining a *Bog* where the Peat is very thick, great pains should be taken, as soon as ever the surface gets dry enough, to trench or plough and pulverise it, to a sufficient depth, to prevent the air and drought penetrating to a greater depth, in the numerous deep cracks that will otherwise open in it; and the Peat, when once thus dried, will generally become hard, incapable of being softened again by water*, and in consequence, will become steril in a high degree, often more so than it was originally, as was experienced in some parts of Crawley Bog, mentioned page 365, and as Dr. William Richardson says, of that part of the Bog of Allen, through which the Grand Canal in Ireland is deeply cut, and acts as a Drain. See the "Agricultural Magazine" Vol. X. p. 23: see also Mr. William Smith's excellent remarks on this subject, in his "Observations on Water-Meadows," p. 97.

* In the sides of many Open-cuts in drained Bogs, I have observed the dried Peat to stand in a face for years, with little more disposition to moulder or perish, than Stone would have, unless of the best kinds: surely therefore, it must be injudicious to *dry* Peat thoroughly, before placing it under dunghills to prepare manure from it, as recommended in the "Outlines of the Chapter on Manures," in the intended General Report, page 47.

Open

*Open Cuts* for Draining are seldom to be seen in this County, and not very commonly do we meet with Fence-ditches, deep enough to answer any effectual purpose as Drains, as Mr. Mundy complains near Derby, see p. 391: at Barton-Lodge and Longford, the deep Ditches of the Norfolk Farmers have been imitated, as observed, p. 86; but the most effectual use of Fence-ditches as Drains, has been made in Foston and Hoon: in the former place, the late Mr. Broadhurst, by very deep Ditches in the Gravel, rendered his Lands sufficiently dry, which before were saturated with moisture: Mr. Thomas Harvey, of Hoon-hay, has deepened his Ditches almost or quite to the level of the water in the Dove, by which all further Draining has become unnecessary; and he stated his opinion, that the same method would succeed on all the vast gravelly flat, by the sides of the Dove, wherever it is too wet.

*Water-furrowing*, or the ploughing out of sods in Grass Lands, is very little practised here, and is indeed so poor and ineffectual a substitute for under-draining, or *Hollow Drains* (which have been pretty fully treated of above), besides having a tendency, where the sods are repeatedly removed, to occasion the furrows to sink, by the treading of Cattle, and round lands or ridges to be at length formed, with very poor cold furrows between, almost as in lands which have been long and injudiciously ploughed and ridged up, that the sooner this practice is every where laid aside, the better perhaps.

The straightening and sloping of the sides of *Brooks* and *Rivers*, has made some progress in this County, but a vast deal yet remains to do, to effect this very capital

pital improvement, to the extent wanted; in the following places I noticed efforts of this kind, viz.:

Ashburne, below or S W of the Town, the banks of the Schoo were sloping and improving in a very effectual manner, in 1808, but I did not happen to learn the name of the improver in this instance.

Belper, from the Bridge upwards, the Derwent has been widened; projecting angles, Trees, Alder-stems, and all other impediments to the free course of the floods have been removed, by those most spirited and judicious improvers, Messrs. Strutts, whose Weirs, Flood-gates, &c. give a more perfect command of this large and very variable River, for the use of their Cotton-Mills, than can perhaps any where else be witnessed. The sides of the River, as far as it acts as a Dam, have been walled in great part, and in order to prevent any ill effects from the penning of the River by their Weir (on pretence of which, several most vexatious actions were a few years ago maintained against them), a capacious brick barrel-arch has been carried from below the Bridge, on the W side of the River, for a quarter of a mile or more, to receive the land and soakage waters. In several places below this, a perfect contrast is shewn, in the neglected and obstructed state of this fine River, by which the mischief of its floods is greatly enhanced. To me, a Law, or the enforcement of those already in being, to compel the removal of Trees and stems of Alder, Sallow, and the like, found projecting over the beds of Rivers, and occupying the projecting points of its banks, seems very much wanted, throughout the Kingdom.

Bolsover

Bolsover and Duckmanton: the Dolee River between these places, at the time of the Inclosures, and again below in Staveley, has been straightened for a greater length, and in a more perfect manner, under Mr. James Dowland, than I have any where else seen.

Little Eaton: the late Mr. Francis Radford, about the year 1790, sloped and improved the banks of the Derwent for near two miles in length, I believe, and which is now a perfect contrast to the impediments to its stream above this, which have been hinted at above.

Longford: here a most capital improvement of the Brook that comes down from Shirley, has been made, by straightening, sloping in, and grassing its side*, for three quarters of a mile, through the Meadows of Edward Coke, Esq.: once a year the Gravel-beds which accumulate in places in its bottom, are taken out, for the repair of Gateways and the Roads, and any sods removed from the slopes by the floods or the treading of Cattle, are replaced, by which the most pleasant degree of neatness is preserved, and scarcely more than a yard wide of herbage is lost to these meadows, by the brook through it.

Staveley: the Dolee thro' this Parish, tho' straightened and highly improved at the time of the Inclosure, as above-mentioned, seems now much neglected; Gravel-beds have been suffered to accumulate in numerous places, by which deep holes, undermining and letting down the banks, are produced in others, and this important improvement is in danger of being again lost thro' neglect. How desirable it would be,

* As was done in all the late Duke of Bedford's Meadows on the N and W sides of Woburn, under my directions, in the year 1795.

to

to see the banks of this Stream considerably more sloped and grass'd, and kept, in some degree at least, like Longford Brook, above-mentioned.

Waldley: here I saw Mr. Thomas Bower, sloping the side of the Brook next his Farm, and forming a valuable range of Compost-heap with its soil, for the improvement of the thinner-stapled parts of his Arable Lands.

The superior importance of this species of Improvement, would not permit me to omit noting, tho' beyond the limits of my agricultural charge, as a Reporter, the improvement of Godley Brook, ½m. N E of Hyde Lane in Cheshire, which runs in very sandy and loose Gravel, but is prevented undermining the banks, and becoming more crooked, by Stake-hedgings of Willows, very neatly done, wherever necessary: in this manner, Proprietors of one side of a Brook might prevent the loss of their Lands, as well as the Brook becoming yearly more crooked, in loose alluvial soils. Below Froghall Bridge, in Staffordshire, I saw the sloping of the sides of the Churnet River, proceeding, just as Dr. Anderson recommends so ably, in his "Essays," and in a manner highly creditable to the Proprietor of the Estate.

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## SECT. II.—PARING AND BURNING.

THE Paring and Burning of Land periodically, as a System, that is practised in the Fen Districts on the eastern side of the Island, is little known in this County, and it is hoped will ever remain so; for altho' in the hands of a good manager, to remedy some defect, perhaps

haps a local one, in the soil, it may prove serviceable and harmless, at distant periods; which length of time has not yet proved, however, in the case of Mr. Lingard (p. 204); yet it is abundantly evident, that where it is freely tolerated, the greatest slovens and worst managers, oftenest resort to its use!, just as the most idle and improvident, most frequently apply to the stimulating effects of strong Liquors, as long as it is in their power to get or use them; and the subject for emulation among paring and burning Farmers of this description too commonly is, who shall soonest obtain an Herbage of Weeds and Paltry on his Land, as the pretence for, and the means of, a fresh ignition! In saying thus much, I am far from wishing to decry this most powerful and useful means, of reducing waste and very rough old Lands, to a state of aration, but which, no Man using it, should at the time, look forwards to the repeating of, or design afterwards so to manage, as to wish or want it; and when Tenants are found thus to reason and act, their Landlords may safely be advised, to leave to their discretion, this as well as almost all other points of management.

Where particular modes of management are found to produce foulness, or unproductiveness, it is the business of the Agriculturist to avoid all such, as well as to be vigilant in the extirpation of Weeds and useless Plants, seed, root, and branch; the too frequent repetition of any one Crop, almost, or kinds of Crops, as white-strawed Grains for instance, being found to promote and encourage particular Weeds (to say nothing of their exhausting effects), such repetitions ought to be studiously avoided; and tho' in general, natural Grasses of the better kinds, may be grown in perpetuity, with sufficient care, without degenerating, yet if particular

soils are found to produce useless Grasses, or other small Plants (that cannot with ordinary pains be weeded out), so much more than Grasses of the better sorts, *permanent pastures* should not be attempted on such soils; as, for instance, on the Coal-shales, in the Valleys in Formarke-Park, prone to black Twitch, when long unploughed, on the Yellow Lime district on the East of this County (that has often before been mentioned, page 201, 356, &c.): the necessity, however, of paring and burning such lands as may have become covered, by a sole and uniform crop of Shar, Pry, or spiked Fescue Grass, does not appear, until it is proved, at least, that its herbage and roots are as ill disposed, when reversed and killed, to contribute to the nourishment of future plants, as its stem and blades, while living, were to the sustenance of animals.

The paring or floteing of Land, as it is here often called, is seldom performed by the plough, but by a paring-shovel or breast-plough, which a man shoves before him; and mostly the sods or turves are as thin as it is practicable to pare them: they are burnt in very small heaps, and perhaps some advantage might arise, from attention to the extinguishing these, as soon as a charring of all the vegetable fibres have taken place, as recommended by my predecessor, Mr. Thomas Brown, at page 58 of his quarto Report.

I shall proceed now to mention the places in order, where I noted this practice, viz.

Arleston, by Mr. George Clay, on breaking up Synfin Moor, for sowing rape.

Bakewell, Mr. William Greaves, Jun. and others, in breaking up rough lands.

Blackwell, Mr. Joshua Lingard, see p. 204.

Brassington;

Brassington; on the Inclosure of the Common on 4th Limestone, N of the Town, in the year 1808, the greater part of it being covered, either with Heath (*erica vulgaris*) or with *moss hillocks**, was pared and burnt, and limed on the ashes, as a preparation for Turnips, generally, and for Oats in a few instances, where it was earliest performed.

Buxton; here, some years back, heathy (4th) Limestone Lands were slowly reclaimed, by profuse liming only: but now Paring and Burning is mostly resorted to; the expense in the whole about 6*l.* per acre, viz. Paring 25*s.*, Burning 15*s.*, Liming with 70 horse-loads (210 bushels), at 1*s.* per load, 70*s.* and Ploughing, &c. 10*s.* The first crop is mostly Turnips, then Oats and Grass-seeds.

Chelmerton: on the Inclosure of this Common in 1808, on 3rd and 4th Limestone, principally, Paring and Burning, and liming on the ashes, was almost general.

Great Hucklow: Mr. William Needham, on the better parts of his allotment from the Common, pared and burnt, sowed Turnips, and fed them off with

* Mr. William Pitt, in his Staffordshire Report, p. 192, speaking of the Moorland Hills, of 4th Limestone, near Caldon, says, "the hills are much over-run with uneven lumps, which seem to be worn out or decayed *Ant-bills*, covered with moss or lichen;" which are the kind of moss-hillocks here spoken of, that on some of the hillocky parts of the Commons, abound so, as almost to touch each other, and appear exactly like old *Ant-bills*; but such are little known in the County, and I am assured, and see reason to think, that these hillocks are solely to be attributed to excrecencies of moss and lichens of particular kinds: they abounded much near Chelmerton Low, on some parts of Hanson Grange Farm, in Pilsbury, and on parts of Hartington Commons, Stanlow-Knowl in Over Haddon, &c. I saw some Ant-hills on Shale N E of Haddon Park.

 Sheep;

Sheep: then dressed with a compost of Lime and Road-side Soil, for Oats; then Oats and Seeds (white Clover, Trefoil, and his own Hay-seeds), fed the first year, and mown next. Mr. John Radford, on a large newly purchased part of the Common, when allotted, pared and burnt, sowed Turnips, eat off by Sheep, and then Oats and Seed, which became good Herbage in the second year.

Hargate Wall: a piece of white-land Common, that is, not bearing Heath, between the Turnpike Road and Mr. Ellis Needham's house, on being allotted to him, was partly encircled with a belt of planting, and in 1804 was pared and burnt (without liming) for Turnips, then Oats, Oats, Fallow limed and dunged for Turnips, and then Oats and Seeds, which succeeded well. Mr. N. also pared and burnt 50 acres of common land: a 30 acre piece was pared in 1805, and limed with 200 bushels per acre for Turnips, a good crop; then Oats, Oats and Seeds, as has been already mentioned, p. 200.

New Haven: Mr. Timothy Greenwood has brought into cultivation great part of 600 acres, on the 4th Limestone, let to him by the Duke of Devonshire (at Will), on the Inclosure of Hartington; he began with paring and burning most of it (at the cost of about 28*s.* per acre) to destroy the Heath, Moss, Moss-hillocks, and other paltry with which it was over-run: then limed, with 120 heapt bushels per acre (burnt on his own Farm at the expense of 3½*d.*, and latterly of 4*d.* per bushel; see the head of Liming in the next Section), and ploughed about two inches deep for Turnips (not hoed), then Oats with Seeds, on the shallowest and thin peaty soils (see Vol. 1. p. 310): but on the deepest and strongest brown soil,

the

the seeds were deferred till the second crop of Oats: the seeds in general remained clean until the second year, when *Chick-weed* and great rough *Thistles* (the curse of these lands) began to shew themselves.

Over Haddon: Mr. Isaac Bennet, Jun. pared and burnt his new Limestone Land from the Common, and limed with 150 bushels per acre, 'for Turnips, then Oats, Oats; and intended then to fallow, and dung with 10 or 12 three-horse cart-loads, and spread 120 bushels of Lime per acre, for Turnips; then Oats or Barley with Seeds, and in the next Winter or Spring, to dung slightly: he has no Lease.

The price to those who undertake paring or floteing here, is 24*s*. or 25*s*. per acre, drying and burning 9*s*. per acre: if the land is full of small Chert rubble (as around Stainlow-Knowl, Vol. 1. p. 140), the price of floteing rises sometimes to 42*s*. per acre.

Paring-spades, or Breast-plough Irons, cost from 7*s*. to 12*s*. 6*d*. each.

Pilsbury: Mr. Joseph Gould has here pared and burnt about 200 acres of short heathy, and about 70 acres of hillocky dry mossy Land, from the Common: the cost about 30*s*. per acre; with the Ashes, 120 to 160 bushels of Lime per acre was spread, and Turnips sowed on once ploughing: these were succeeded by white Oats, except that occasionally, black Oats were sown on the poorer parts, tho' they don't ripen so early as the white ones; then Oats again, then Fallow, with 10 or 12 two-horse cart-loads of Dung (perhaps ten tons) and 120 to 150 bushels of Lime (two stricken and one upheapt) per acre, for Turnips, and then Oats and Seeds.

On Ashby Wolds, which tho' in Leicestershire is

almost surrounded by this County, Mr. John Johnson, of Union Lodge, pares and burns, and spreads three tons of Ticknall Lime per acre, for Wheat (but in the low rushy parts, Oats), then fallow, with Turnips on some of the lighter parts, and Barley or Oats and Seeds, to lay three years; the intended succession being, Oats, Fallow and Turnips, Barley and Seeds.

Here, as well as formerly in Measham, the late Joseph Wilks, Esq. made use of thick paring or ploughing, and burning the Coal sleck, Shale and Clay of old Coal-works, according to Mr. William Pitt's Leicestershire Report, p. 185.

In Ashover, Alton, Brockhurst, Northedge, Prass, &c. rather a novel use of Paring and Burning has been made, within a few years past, viz. immediately after the carrying of their Wheat and Oats, the Stubbles are pared, and the Straw, Weeds, Roots, and a considerable quantity of soil among them, are ignited in small heaps, in the field; the Ashes of which are spread, and frequently Lime, and Wheat is sometimes sown after Oats, or even after Wheat, but in other instances, Autumn or Stubble Turnips are sown, for Oats next Spring. Many incline to think with me, that the practisers of these new schemes, will rue, ere long, the exhausted state of their Lands; which are chiefly on argillaceous Gritstones in the Coal Measures.

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## SECT. III.—MANURING.

Many particulars relating to Manuring for particular Crops, will be found in the Section on Courses of Crops, p. 102, and those relating to the various Grains, Roots,

Roots, and Plants in Chapter VII. and on Meadows and Pastures in Chapter VIII. p. 184, which need not here be repeated: but I will proceed to notice what remains in my Notes, in the order prescribed, viz.

*Marling*.—In several parts of the Red Marl Districts (see the Map, Vol. I. p. 97), Marling was formerly much practised, but owing to the want of hollow Draining, then little if at all known, probably, these Lands, by repeated, or too copious Marling at once, became too tenacious and cold, as observed, Vol. I. p. 148; but now, and especially some years after Draining has been successfully performed, and had time to lighten, and render the soil pervious to water (as this ground-work of all other improvements generally does, and often to a remarkable degree) I cannot doubt, but the large ancient Marl Pits mentioned Vol. I. p. 456, and wherever else found, might be resumed with good effect, and new ones opened. In all my travels in Derbyshire, I do not remember to have noticed the recent use of the Red Marl, except N of Doveridge, at Osmaston Cottage, by John Beresford, Esq., at Wadley (by Mr. Thomas Bowyer), and at Ingleby (by Mr. Edward Brown); and nowhere to have seen the alluvial Marls in use, Vol. I. p. 456.

Since writing page 446 of the First Volume, I have ascertained, that most of the *Marls* there mentioned, as found in the Coal-measures, are in the 9th Coal Shale, being that wherein the Muscle Shells are so plentifully found, in the Shale as well as in the Dog-tooth Ironstone-rake therein (I. 414): and from the same Stratum preserving its character, as a Marl, into Yorkshire, as far as Rothwell Haigh beyond Wakefield, as mentioned, page 213, I feel great confidence in the practicability and use, of

 opening

opening valuable *Marl Pits* on the basset of this calcareous Stratum, as hinted, p. 446, Vol. I. when its exact place in the series of Strata is better understood. The effects of Marl and Lime in unfitting Soils for the production of *boiling* Pease, has already been noticed, p. 132.

*Liming.*—Few observers of rural affairs can have passed through the Peak Hundreds of Derbyshire, and their surrounding Districts, without having been struck with the great and important use, and the astonishing effects of *Lime* there, as a Manure; and the Farmers of Bedfordshire, Buckinghamshire, Hertfordshire, and several others in the more southern parts of England, where very pure calcareous Strata lie quite unheeded by them (except when they want to set a Bricklayer to work), can scarcely be made to believe, the avidity with which Derbyshire Farmers search after Limestone, of the nature best adapted to their particular soils, and how they toil with it over the hilly roads of an uneven country, to the distance of eight or ten miles; while in many instances the Farmers of Cheshire and Yorkshire come near twice these distances, to fetch the *Peak Lime**, in Carts; and that by means of the Canals, it is distributed around from Crich and Peak Forest to the distance of 30, 40, or more miles, *for Agricultural purposes!* even into the vicinity, and to spread upon other calcareous soils, in some instances, on account of its superior effects, in

* In the First Volume, p. 235, I have mentioned the great probability there is, that this valuable Stone might be mined for, and easily obtained, in several of the Districts, distant from the Limestone Hills in the Peak Hundreds of Derbyshire.

properly

properly stimulating vegetation, compared with the Lime of the stone, prevailing on the east side of the County (which I call the Yellow Lime Rock, Vol. I. p. 156), and about Mansfield, Notts. in particular: and yet, some thin *blue beds*, lieing in Clay, near the bottom of this Yellow Rock, in Derbyshire, have long been selected and burnt for Lime at Stoney-Houghton and at Oxcroft, and had considerable reputation with the Farmers, of Limestone and other Lands, for some miles round, as a *mild* or pure Lime, very similar in its effects to the Peak Lime, and not liable to destroy or prevent all future vegetation, if laid on too thick, or where the heaps are put down in the field, as with the *hot* or Magnesian Lime from the Yellow Lime Rock, and some others, is the case; all this I say was known for years, within a considerable circle, without any one being induced to trace these blue beds into the adjoining Parishes, or to discover them elsewhere, apparently for want, of those general and extended ideas with respect to *stratification*, which we owe now to Mr. *William Smith* (see Vol. I. p. 108): it is true, that long ago, accident probably, had exposed these beds in the Quarries at Wood-Nook in Teversall, Alt-Hucknal W of the Church, S of Palterton, and N of Bolsover, but owing to the want of a knowledge of their particular properties, or of care in keeping them separate from Magnesian Beds, found in the same Quarry, the expectations of the Husbandman were often disappointed, in the use of these Limes*: and to

* In the same manner as great numbers have been disappointed in not meeting with the pozolanic or water-setting property of the *Blue Lias* Lime (of Barrow-on-Soar), when the Beds are indiscriminately burnt, as is too common at Lime-works, as observed Vol. I. p. 115.

similar

similar accidents was it also, I believe, owing, that Mr. Edward Scholefield, in the year 1800, discovered and opened a Quarry in these Beds, at Knitaker in Barlborough, and where he has, for some years, sold near 30,000 bushels of this Lime annually, much to his own benefit, and that of the Agriculture of the District: and that Mr. Henry Bowden since found and opened these Beds, N of Walls in Whitwell.

The knowledge, of the high probability that there is, of finding these valuable Beds of Stone, to enrich the soil through a line of country extending 80 miles or more in length, in the Counties of Nottingham, Derby, and York, and Coals also, at no vast depth beneath them*, con-

* This distance between the Blue Beds, and the nearest good Coal-seam beneath them, may be expected to vary considerably in different places, I am inclined to expect; because I find, that the *Sand* under the Yellow Lime Rock, of which several Pits are enumerated in the First Volume, p. 463, is subject to very considerable *variation in its thickness* (as observed of other strata, Vol. I. p. 176, &c.), and is sometimes found concreted into a yellowish-brown, or a Salmon-coloured Grit Rock, as on the S W side of Hardwick Hall (I. 418); which Rock I have had an opportunity, since the First Volume was published, of examining at East Rigton, Bardsea, East-Keswick, Collingham, &c. near Wetherby in Yorkshire (Phil. and Geolo. Mag. XXXIX. p. 103), and find it there of such great thickness, and of a quality so different to what I had expected, that it induces now a doubt, whether I have not, Vol. I. p. 167, &c. described the great zig zag Fault as passing on the wrong side of Harthill Town? and in such case, that the salmon-coloured Grit of Harthill, I. 169, 432, 436, 438, may belong to this Stratum, immediately under Yellow Lime, and not to the Rotherham Rock, as I had, relying too much on its quality, supposed to be the case; and also, that the Gritstone seen on the lower or W side of Whinney-lane Quarry S of Harthill (I. 410), as well as that into which the lower part of the Sand-Pit ¼ m. S W of Pecks Mill (Street Lane, I. 464) graduates (as I find by reference to my Notes made on the spot, though unintentionally omitted to be noticed in the First Volume), may belong to this same Stratum, whose occurrence as a Sand, is often noticed in the List, p. 463.

tained in my First Volume, page 158, &c. will, it is hoped, induce a diligent and systematic search after both of them, as well as separate trials of each of such *Beds of Stone* when found, to discover which of them can be mixed together and burnt for the Farmer's use, freely and without fear of injury, as he would use the Peak or other mild Limes; and which of them should be separately burnt for the Mason's use, or to be more cautiously used in Agriculture, or perhaps used as Stone in Walls and Buildings, Roads, &c. instead of being burnt at all, in some cases: and I have the satisfaction now of stating, that the Rev. Edward Otter of Bolsover Castle, profiting by my information on this head, has succeeded in finding the proper Beds of Blue Limestone within his Farm at the brow of the Hill, and had, when I was last there, built a Kiln, and limed a good deal of his Land on the Coal-measures, lieing below on the slope of the Hill.

The Magnesian or *hot* Lime, is not peculiarly the produce of the Yellow Lime Kilns, but some of the Beds in the Second of the Peak Limestone Rocks produce it when burnt, at Matlock Bath and other places, while other Beds in this Rock (as in the case of the Blue Beds above) can be safely used by the Farmers, in almost any quantity, as I noticed in the use of Lime made from this Rock, in a Field on the north-eastern slope of Masson Hill in Matlock; in general, the too free use of Magnesian Lime, will not only kill the existing plants, where the heaps lie previous to spreading, in particular, but such spots won't grow Quicks, in case of a Fence being made across them, at the distance of some years subsequently, as I have been assured by some persons.

Mr. Marshall, in some experiments on the Breedon Lime, on the borders of Leicestershire, which is thus Magnesian and hot, found, that being two or three times

times turned in the Field, after slacking on a headland, before it was spread, it had lost this property inimical to vegetables: and certain it is, that those who are very careful in spreading small quantities of this *hot* Lime, without previously making heaps of it on their Land, but in a waste corner devoted to the purpose of slacking it, have found it answer quite as well as the mild Lime; and many, like Mr. Thomas Lea of Stapenhill, p. 107, are in the habits of using both, constantly, on their Lands: but which may perhaps be of that nature, as to require a stimulant, rather than a larger addition of mere calcareous earth, to their vegetable soils: the subject of Liming, and its operation on the soil, is, however, involved yet in so much mystery and difficulty, that I trust I shall have performed a useful service in mentioning here, or in the Sections on Courses of Crops, page 102, and on the Cultivation of different kinds of Crops which follow to page 159; in the Chapter on Grass Land, page 174; on breaking up Land, page 203, and in the Section on Paring and Burning, page 400, as many particulars relating *to the practice* of Liming in Derbyshire, as my travelling Notes furnish.

Mr. Francis Blaikie, the intelligent Agent of Earl Chesterfield at Bradby-Park, stated to me his opinion, that Lime is often used and repeated, as he suspects, from custom, and without doing any material good: which is so far confirmed, by Mr. John Webb's experiments at Barton Lodge, herein after related, and at page 121, as to shew at least, the propriety of frequent comparative trials, with and without Lime in the same field; and some are of opinion, that it improves the quality of Grass Crops, without adding much to their quantity: yet the great and striking effects, of spreading 300 to 600 bushels of Lime on Heathy Lands, on

Lime-

Limestone Subsoils, seems permanent, as is particularly exemplified in and near Buxton and other places; as also, on argillaceous Gritstone Subsoils, in Macclesfield Forest, near this County (as mentioned page 38), and in other places.

Lime has a strong tendency to increase or produce *Thistles* in the Soil, as most Derbyshire Farmers seem to imagine: that these plants, in common with white clover (page 159) and grasses of various sorts, may languish unnoticed, under the baleful shade and influence of the Heath, and that the stimulant which removes the sterility, necessary, apparently, for the flourishing of the latter, may give new life and even apparent existence to the former, will readily be granted: but that its use, on Land that has long been occupied by Grass or Corn Crops, can there engender Thistles, those best acquainted with the economy of vegetable existence, will doubtless deny: and to me, a more obvious explanation of this seeming production of Thistles by Lime, presented itself, in the profuse dissemination of the winged Seeds of these cursed plants, in all directions, during the summer months, but more, in the slovenly carelessness observable in using, even the inadequate nostrums so plentifully invented, for the extirpation of these hardy and troublesome weeds, which I have slightly noticed at page 191: deep spudding, or the use of an iron tool, like that used for drawing docks, to enable the pulling of them up root and branch, as often as they any where appear, thro' a considerable period of time, can alone remove this crying disgrace of Derbyshire Farming, which is in most other respects, deserving of great commendation.

The dark coloured Limestones (as those beds on the top of the Crich, or Fritchley Quarry) which make a

very

very white and flowery Lime when slacked, are in the greatest repute with the liming Farmers. It was stated to me on the borders of Nottinghamshire, by Mr. Thomas Walker, of Eastwood, that Liming on the Coal-measure Clays, makes the Crops backwarder by 10 or 12 days in ripening, and that such succeed best in dry weather, after a dressing of Lime.

In burning the 4th Lime Rock, at Grin-Hill, S W of Buxton, and formerly at Dove-Hole, on the W side of Peak-Forest, enormous heaps of refuse Lime, called *Lime-ashes*, have been accumulated and left, covering many acres of ground, the tops setting or hardening by degrees, after being slacked by the rains, so that large excavations can be made and remain permanent, under these artificial stone domes, and in which singular kind of Huts, many families live near Buxton, as observed in p. 22. At Buxton I was informed, that their Coals (from Thatch-marsh, and Goyte-moss), being bad, and slaty and brassy, occasioned their Lime Ashes to be so heavy, that the distant Farmers from Cheshire, &c. would not carry them away, but if measured with the Lime, would pick them out, and throw them on the Ash-heaps, and in which way they had indeed, been in part accumulated: it seemed, however, rather surprizing to me, that the occupiers of Lands near, had not fetched away and spread these heaps of Lime and Coal-ash Compost, as I have been informed that some have done in Peak-Forest; and I could not help referring this neglect, in great part, to the aversion to, and entire waste of *Coal-Ashes* as a Manure, by the Farmers, thro' the greater part of the County, tho' certainly a valuable article, as I shall further mention, under the head of Ashes, in this Section.

It too often happens at the Sale Lime-Kilns, especially

cially when trade is brisk, at the run or perpetual Kilns, that the stone is not broken small enough for the time allotted for burning it, but the Farmer, after dragging home a load, much heavier than it ought to be, finds, some months after liming, and ever after, unless picked up, on ploughing his field, that the same is strewed with Bull-heads, or Lime-cores, in large stones of unburnt Lime. When Lime is over-burnt, or with too violent a fire, particularly of the hot sorts (as I saw at Palterton and at Wild-Park), it melts and runs together, won't slack, and becomes useless to the Farmer: this is called dead Lime, in a paper on the subject in Mr. William Nicholson's Journal, Vol. XXIV. p. 381.

I will now proceed to mention the principal *Sale-Kilns*, or places were Lime is burnt and sold to the Farmers and others of this County, tho' several of them are situate out of it; with such particulars respecting the structure of their Kilns, processes in burning, measure, and prices of their Lime, its quality, &c. as I happened to note, when at the places (see the List of Lime Quarries, Vol. I. p. 408), viz.

Agnes Meadow, 1¼ *m.* S of Kniveton: dark blue Shale Limestone; some of the beds pozolanic, and make very good Lime for Water-Works, if separately burnt. The strata astonishingly contorted, here and at lower Hall-Field, see Vol. I. p. 231.

Alport in Yolgrave: S E of the Village, dark beds with layers of Chert, near the top of the 1st Lime.

Alt Hucknal, in the Road to Stanesby Mill, blue beds in Yellow Lime: I am not sure that I saw a Kiln at this Quarry.

Ashford,

Ashford, W: black beds of Shale Limestone; some make excellent water Lime.

Ashover; the most ancient and greatest number of Quarries of Limestone, are to be seen in the denudated patch of the 1st Limestone around this Town, of any place in Derbyshire, perhaps: the thin shattery beds on the top of the Rock, seem to have been anciently worked, almost all over the surface, and before the use of Gunpowder, enabled the attacking of the hard pure Limestone Rock beneath, probably; in a subsequent period, large, and some deep Quarries were worked, to the N W of the Town (Hatewood, Beighton, and Twitch-bank Quarries), and others to the Southward of the Town (Holes, Stoneacre, Stanstedge, Jetting-street, Black-grove, Wood-head, &c. Quarries), all of which are now disused, or nearly so, and the extensive Quarries and Kilns now used, are all S of the Town, stretching towards Mill-Town, viz. *Town-End*, occupied by Messrs. George Allen and Co.; *Hockley* by Ditto; *Long-fall* by Mr. John Twigg; *Allens* by Messrs. George Allen and Co.; *Fall-hill* by Mr. John Twigg, and *Birks* by Mr. Abraham Birks; besides a Quarry lately opened E of these, by Hardmeadow Lane, by Mr. Joseph Butler, for the use of his Iron Furnace (Vol. I. p. 399), and his Sale Kiln at Woodthorp; from which Kilns, collectively, very great quantities of Lime are fetched by the Farmers' Carts and Waggons from the Eastward, during all the Summer months, particularly since the making of a new Turnpike-road, on which the Hills, tho' long, are not near so steep as formerly; this Road extends from Mill-town, by Little-moor and Briton-wood-Nook, to

to Tupton, where it connects with the Chesterfield and Derby, and other Turnpike-roads. Many of these Carts bring Coals, and either sell them to the Lime-burners, or exchange them for an equal measure or cart-full of Lime.

The *Prices* of Lime at these different Kilns, used formerly to differ, and often vary, until some years ago, that the different Lime-burners agreed among themselves, all to sell at the *same price* per *load*, of three strikes or bushels, which has been 9*d*. since Christmas 1811: but competition again prevailing among them, the quantity has been increased by some, and often varied, until the Load is now almost become a nominal quantity (as the *Ton* of Coals formerly was, Vol. I. p. 182), and two-horse Carts, which pay for six or seven Loads, will often take in reality eight or nine Loads; and three-horse Carts, on paying for nine Loads, have sometimes ten to twelve Loads given them, at some of the Kilns, as I am informed.

Mr. John Milnes, who has paid much attention to the construction of large *Lime-Kilns*, particularly the running or perpetual Kilns, as all these at Ashover are, gave me the following account of his principles of constructing Kilns, viz. Whatever be the depth of the Kiln, it should be about one-third of that in diameter near the top: one-sixth part of the depth of the Kiln at the top should be cylindrical, except the upper three or four courses, which should draw in a little, to allow for burning away, which takes place principally at the top edge: from the bottom of the cylindrical part, the Kiln should diminish pretty regularly to the bottom, where it should be about three feet diameter, and have two draw-holes with a midfeather

or jaumb of stone between. The objects in view to be attained are, that the fire or burning may be confined to the cylindrical part, allowing the Lime to cool as it descends, by slow degrees, in the conical part, along the sides of which it is desirable that the pieces of Lime should roll, or tumble, and not that the whole mass of Lime should settle together, much less break down in a hole in the centre. The Kilns here seem from 20 to 25 feet deep.

Aston on Trent: at the Wharf on the Trent and Mersey Canal, Stone from *Crich* is brought and burned, and Lime was, in 1808, sold by Messrs. Edward Banks and Co. at 3*s*. 11*d*. per quarter of 8 bushels.

Atlow, S W of the Town: the blue Shale Limestone here, makes excellent building Lime and some Water-Lime, but the Farmers of Strong Land, have found it rather to *set* than to lighten their soils, I was told.

Bakewell: these Quarries are in the 1st Lime, and the quality good.

Barmoor, or Black-hole, at the N W corner of Peak Forest: the Rail-way branch from the Peak Forest Canal runs thro' these Quarries, having passed the 1st Lime (on account of the great quantity of Chert beds in it), and the third, in a great measure also (on account of its hardness), since the 4th Lime was reached at *Dove-hole*. See page 299, Vol. I. and below, p. 423.

Birchwood Park: the whole of this isolated patch of Limestone, seems occupied by a Quarry of nine or ten acres, thro' which a Turnpike-road passes, between Ellaston in Staffordshire and Darley-Moor, on the Ashburne and Sudbury Road; the stone is bluish grey, in a very thick Rock. Mr. Thomas Cockson

here

here sells his Lime, which is very white, at 8*s*. 8*d*. per score bushels, heapt; about five score of it is usually laid on per acre, and principally on Arable Land. He gets Coals, which cost 13*d*. per 120 lb. from about Chedale, and N of it.

Bolsover, ¼ *m*. N of the Town, are large, but not very deep Lime Quarries: grey compact beds of Limestone that burn to a white Lime, and below are 12 blue beds, with intervening clays, that make a mild Lime, as has been already mentioned, p. 409.

Bonsal-dale, S of the Town.

Breaston and Draycot Wharf, on the Derby Canal; hither the *Crich* Limestone is brought and burnt; and Messrs. Edward Banks and Co. sell their Lime at 3*s*. 6*d*. per quarter of eight bushels.

Breedon, Leicestershire: these works are on the N E side of the Town, in very extraordinary rearing, or highly inclined measures or beds: Mr. John Hasket here sells a waggon load of Lime, containing about 96 heapt bushels, for 19*s*. 3*d*. and 1*s*. for loading: the lower part of some of these very inclined beds, are said to make a white and mild Lime, very fit for Agriculture, while the upper part of the same bed, burns to bluish dun Lime, hot, and less fit for such purpose: which, as well as the Shells, found in the upper part, only, I believe, seem to shew these strata to have been originally formed in such inclined position, and not since ruptured and set almost on edge.

Brinsley Wharf, Notts, on the Cromford Canal near Aldercar in that County: the *Crich* Limestone is brought and burnt, in large walled Pye Kilns.

Bull-Bridge, or Amber Wharf, S of Crich on the Cromford Canal, to which the *Crich* Limestone is

 brought

brought down on a Rail-way: here Limestone is delivered into Boats at 2*s*. per ton, by Edward Banks and Co. The Lime-kilns here, have a thick flat iron ring, cast in segments, fixed round their top edge, to preserve the stone-work of the Kiln.

Burrowash and Spondon Wharf, on the Derby Canal: hither the *Crich* Limestone is brought and burnt, and Messrs. Edward Banks and Co. sell their Lime at 3*s*. 7*d*. per quarter of eight bushels.

Buxton, S, at Ferney-Bottom, from the 4th Limestone. See *Grin* Hill.

Caldon Low, 1 *m*. S of the Town in Staffordshire; these very extensive Lime-works in the 4th Rock, being now, by means of the Rail-way to Froghall, and the Canal lately completed thence to Uttoxeter, able to supply Doveridge and some other parts of this County with Lime, it is mentioned here, tho' Caldon is beyond the distance for Farmers to fetch Lime from the Kilns into Derbyshire, I believe; Messrs. Gilbert and Co. here sell Lime from the upper beds, to the Tenants of the Earl of Shrewsbury (the owner of the Soil) at 4*d*. per horse-load of three level bushels, and at 7*d*. to others. The Kilns here are 30 feet deep; at top they are seven feet diameter, at seven feet lower, six feet diameter, at four feet lower, twelve feet diameter, and continue this size for seven feet down, then in the lower twelve feet of depth they diminish to two feet diameter. I observed here a practice very wasteful of Coals, that of piling up Stone and Coals four feet high or more on the Kiln-tops before night, which are left to flame out to waste, instead of the Men attending to supply the Kilns at proper intervals during the night.

Calke, E at Dimins Dale, adjoining the Stanton-Park

Park Lime-Works: thick beds of dark grey Limestone here, make white Lime when slacked.

Calver-Peak, W of the Village, large Quarries in 1st Lime Rock: the Kilns are very large, and the light grey Lime made here, is in very high repute with the Farmers of the north of the County, and in Yorkshire, as well as with the Iron Masters. Vol. I. p. 399.

Chapel-en-le-Frith: near the Rail-way from the Peak-Forest Canal are Kilns, for burning the Limestone brought down from *Barmoor* and *Dove-hole*, or the Black-hole Quarries.

Clouds-Hill in Worthing, Leicestershire: a Rail-way from hence to the Ashby-de-la-Zouch Canal in Willesley, supplies some Lime to the southern parts of this County: the measures here are rearing, as at Breedon: they have beds that make bluish Lime, and others make white, the latter being most esteemed by Farmers.

Clown, W of the Town: magnesian, or hot Lime; a little E, the basset of the blue beds, might, I think, be found.

Codnor, Lower Park Wharf, on the Cromford Canal: here Messrs. Edward Banks and Co. have extensive Kilns for burning the *Crich* Limestone, brought hither in Boats; and a Dock roofed over, enables four or five boats to load Lime at once, under cover from rain: they sell it at 2*s.* 9*d.* per quarter of eight bushels: and Limestone at 3*s.* per ton. Advantage has been taken of the Locks on the Canal, to unload the Stone and Coals at tops of the Kilns, and load the Lime at their bottoms, as I shall further particularize in describing *Marple-bridge* Limeworks.

Crich: N of the Town, are several ancient Quarries, some now worked, of the grey entrochian 1st Lime-

 stone:

stone: which makes a light grey Lime, in great repute for Agriculture. S W of the Town is a large old Quarry in the Black Beds on the top of the 1st Rock, which makes the very white Lime used for White-washing, &c. which is mentioned, Vol. I. p. 308, but where, by an oversight I have said, that this snow-white Lime is from grey Stone.

S E of the Town is the Quarry which was began about 20 years ago, by driving a Tunnel of 100 yards long into the Hill, through which a Rail-way was laid, extending from the Cromford Canal, as soon as completed, and by which Limestone has since been conveyed down to Bull-bridge Wharf, and thence distributed by Canals, and afterwards by Carts, far and wide: it is surprizing to see what an immense Pit has in this short space of time been formed: the upper beds of this Quarry are black, and make white Lime, as above; and the lower are grey, and in great repute at the Iron Furnaces (I. p. 399), as well as with the Farmers, wherever it goes.

Cromford: a great deal of Limestone was dug here in the 1st Rock, for some years after the Canal was completed, but the principal Quarries nearly in front of Mr. Arkwright's House are now shut up: its price here is, I believe, 10*d*. per horse-load of three heapt bushels.

Crowdycote in Hartington: here the 4th Lime Rock is accessible by the Turnpike-roads through Longnor into Staffordshire.

Derby: at the Canal Wharfs on the S E of the Town, considerable quantities of the *Crich* Limestone, brought thither in Boats, are burnt; Messrs. Edward Banks and Co. sell their Lime here at 3*s*. 7*d*. per quarter of eight bushels.

Dirty

Dirty Hucknal, Notts: here are Quarries and Kilns of the hot Lime, which Farmers fetch into Blackwell, and the adjoining Parishes.

Disley, Cheshshire, N E of the Town, are Kilns on the banks of the Peak Forest Canal, for burning the Peak Forest (the *Barmoor* or *Dove-hole*) Limestone; part of Glossop Parish is supplied from these Kilns, with a mild and useful Lime.

Dove-hole, or Black-hole, in the N W corner of Peak Forest Liberty: S E of the Houses, the ancient Kilns in the 4th Rock, mentioned, p. 414, were situated, as the large heaps of Refuse or Lime-ashes over 30 acres of ground or more, will long testify: the present Works are N E of the Houses, at the head of the Rail-way from the Peak Forest Canal, in the 3d and in the 4th Rocks (separated by a bluish green, decomposing Toadstone), the latter being greatly preferred by the Quarrymen, on account of the comparative ease of working it, as observed, Vol. I. p. 299, and II. p. 418. The Lime-Kilns here, in occupation of Mr. George Pot, being sunk considerably in the Rock, a steep inclined Gang-way leads down to the Drawing-holes, and a long Rope passes over a pulley fixed at a distance from the top of this Gang-way, to the ends of which the men employed in drawing the Kiln, attach their Wheel-barrows, so that one man, in wheeling down his empty Barrow, greatly assists another, who could not otherwise wheel up his loaded one; an ingenious contrivance,[¶] that would prove useful in some other situations, for allowing depth enough of Kiln for the Lime to get properly cooled.

Glapwell: here some hot Lime is prepared, and I

 doubt

doubt not but the Blue Beds might be obtained to make mild Lime, by a search in the Measures below these Quarries, in the face of the Hill.

Grin Hill, 1 *m.* S W of Buxton in Hartington, is a large and high Hill of the 4th Rock, almost entirely covered by the Ash-heaps of former and present Lime-kilns, as mentioned, page 414; the Lime is mild and good, of a light grey colour, and is fetched from great distances into Cheshire and Staffordshire, as well as northward in this County, to less distances: it has struck me, that these Works might, with some propriety, be moved about two miles southward to Thirkelow-gate, on the same Rock, which being much nearer to, and almost as high as the Grand Ridge, would vastly lessen the draught of Lime up the Hills to the south-west of the present Works; while the Coals, as at present worked, are almost on the Grand Ridge. In this case, the disgusting desolation of Grin Hill, as viewed from Buxton, and almost every part of its vicinity, might perhaps be removed, by planting it with Ash, &c.

Haddon, S W of the Hall, near Great Rowsley: in a raised part of the 1st Lime Rock, near a great Fault and Shale south of it, I, 290, Note. This Quarry and Kilns are situated by a Turnpike-road leading to the eastward,

Hartington: from hence mild Lime of the 4th Rock goes into Sheen and other places in Staffordshire.

Hognaston; N W of the Town, dark blue Shale Limestone is dug and burned: the Lime seems to have been in repute, by the size of the excavations: its price is 7*s.* 6*d.* per score heapt bushels.

Horninglow Wharf, N of Burton, Staff. on the Trent and

and Mersey Canal; *Crich* Stone is brought and burnt; Lime is sold here by Messrs. Edward Banks and Co. at 4*s*. per quarter of eight bushels.

Ilkeston-Common Wharf, E of the Town, on the Erewash Canal: *Crich* Limestone is here brought and burned, and sold by Messrs. Edward Banks and Co. at 3*s*. 3*d*. per quarter of eight bushels.

Killamarsh Wharf, on the Chesterfield Canal: Yellow Limestone, brought from *Peck's Mill* in Yorkshire (Vol. I. 411) is here burned, and its hot Lime sold to such Farmers as use it.

Knitaker, 1½ *m*. N E of Barlborough: Mr. Edward Scholefield's Quarry, mentioned, page 410, has, in 15 feet of its depth, numerous thin Beds of bluish Limestone, none exceeding eight inches in thickness, interlayed with Blue and Yellowish Clay: he got his Coals from Norbrigs, 3¼ *m*. distant, and sold his Lime in 1809, at 10*s*. per chaldron of 32 heapt bushels: 60 to 130 bushels per acre being used as a dressing. Mr. Henry Bowden had intentions, as I was told, of opening a Pit and Kiln on his Land, near to the above, as being more accessible from the Roads, than his Pit at *Walls*, that will be mentioned further on.

Kniveton, ½ *m*. N E; some of the Shale Limestone here is grey, and some of it blue, and shattery in the weather; Mr. Robert Wigley has separate Kilns for these two sorts of Lime, the latter being much prized for Water-works, and the former for Agriculture; he sells it at 8*s*. per score heapt bushels; three to six score being used per acre.

Langley-Mill: at the Wharfs here, near the meeting of the Cromford, Erewash and Nottingham Canals, Stone is brought from *Crich* and burnt, by Messrs. Edward Banks

Banks and Co. and sold at 3*s*. 1*d*. per quarter of eight bushels.

Long Eaton: at the Wharf here, on the Erewash Canal, *Crich* Lime as above, is sold at 3*s*. 5*d*. per quarter.

Marple-Bridge, SW; on the Cheshire side of the Goyte, on the Peak Forest Canal, Samuel Oldknow, Esq. has very extensive Lime Kilns for burning Stone of the 3d and 4th Rocks, brought from *Barmoor* and *Dove-hole* Quarries, in Peak Forest, abovementioned: the structure and arrangements of these Lime-works are the most complete that I have seen. Where four Locks occur near together on the Canal, a branch has been taken out of the upper pound to a Dock, where the Stone and Coal Boats lie to unload, level with the tops of the Kilns, which are 12 in number, and can burn 2500 bushels of Lime daily! From the bottoms of the Kilns, Rail-ways are laid, and conducted, some into a Boat-house, over two Boats that can lay in a Dock connecting with the lower pound of the Canal, and have their lading of Lime tippled or turned over into them from the Trams on the Rail-way, under cover from rain; others of the Rail-ways are conducted into a Lime-house over four or five Carts or Waggons that can stand at the same time, and have the Lime tippled into them, secure from the weather; and others to Tipples without covers. The Kilns are rather egg-shaped, 36 feet deep, 13½ feet diameter at top, and 14½ feet in the belly or widest place at nine feet down; diminishing thence, to 3½ feet diameter at bottom. Iron shovels are used to draw the Lime at 20 inches above the floors on which the Rail-ways are laid. Between the bottoms of the Kilns, roomy arched

arched Stables are constructed, in some of which the Farmers feed and rest their Horses, while their Carts and Waggons are loading, and others are let to the Boat-men for their towing Horses. The high wall in the front of the Kilns, being strengthened, and its line broken by some circular Buttresses, faced so as to imitate an ancient Castle, has a good effect, from its commanding situation, so far above the level of the Valley and Grounds at Mellor-Mills.

Mr. O. purchases his Limestone of the Canal Company at the bottom of the Rail-way at Bugsworth Wharf near Whaley-bridge, at 2*s*. 1*d*. per ton (20×120 lb.), and Coals of an indifferent quality, called Sleck, are delivered to the Kilns at 5*s*. to 6*s*. 8*d*, per ton; and he sells his Lime at 14*d*. per load of ten Winchester level pecks.

One half of the large quantity of Lime burnt here, is fetched away by Carts and Waggons; three quarters of this moiety for Agricultural purposes, and one-fourth for Cement, except what the Bleaching-houses and Calico Printers take: the other half of the whole, goes away northward by Boats, as far as Bolton, Bury, Rochdale, Saddlesworth, &c.; and now probably, since the Tunnel near the last place has been finished, this valuable Lime will go forward to Huddersfield, and further.

In charging the Kilns, the Stone is broken into lumps, weighing from ¼ lb. to 6 lb. each—three tons of Stone (20×120), with one ton of Coals (20×112), produce on the average 15 loads of Lime (of 10 pecks), each weighing 10 score (of 20lb.) I observed here, the piling up of Stone and layers of Sleck (that I have spoken

spoken of at page 420) before the men left work at night: and Mr. O. told me, that such piled part of the Lime, when burnt, was found much the whitest: I cannot, however, but consider it as a great waste of fuel.

Matlock: considerable quantities of Lime were formerly burnt from the 1st Lime Rock in this Town, and near the Bridge, and some is yet burnt: the price is 10½*d.* per load of three bushels.

Measham Field, E of the Town: at Ilot Wharf, on the Ashby-de-la-Zouch Canal, are Kilns for burning the *Ticknall* and *Clouds-hill* Limestone, brought hither by the Rail-ways and Canal.

Oxcroft in Bolsover: Mr. Henry Simpson here occupies Quarries, and Kilns for the Blue Beds in the Yellow Lime Rock, whose Lime has long been in repute for Agricultural purposes, as observed, p. 409.

Peak-Forest, ¾ *m.* N W of the Town: the large Lime Quarries here, were more extensively used formerly than at present, since the Peak Forest Canal and Rail-way have been in use; vast heaps of Lime-ashes, accumulated here, have began to be used by the Farmers within a mile round, for spreading on their Land.—See *Barmoor*, and *Dove-hole* or Black-hole Quarries.

Pindale, E S E of Castleton: the Lime Quarries here are in the 1st Lime Rock.

Pinxton, S. At the Wharf at the head of the branch from the Cromford Canal: the *Crich* Limestone is burnt.

Pye-bridge Wharf, near Somercotes, on the Cromford Canal: here are Kilns for *Crich* Stone, as above.

Sandi-

Sandiacre Wharf, on the Erewash Canal: here Messrs. Edward Banks and Co. sell their Lime at *3s. 4d.* per quarter of eight bushels, made from *Crich* stone.

Sawley Wharf, or Trent Lock: here *Crich* Lime is burnt, and sold as above, at *3s. 5d.* per quarter.

Shardlow: at the Wharfs here on the Trent and Mersey Canal, Stone from *Crich* is burnt and sold, by Messrs. Edward Banks and Co. at *3s. 11d.* per quarter of eight bushels.

Shipley old Wharf, near Newmanleys-Mill, on the Erewash Canal: here *Crich* Lime is sold as above, at *3s. 2d.* per quarter of eight bushels.

Skegby, Notts.: at Stoneyford or Stainforth Lane, considerable quantities of Yellow Limestone is burnt: the Lime hot or Magnesian.

Stanton by Dale, N: at Hallam Bridge on the Nutbrook Canal, Limestone brought from *Crich* is burned.

Stoney-Houghton, N W of the Village: here, is a local excavation in the Valley, thin Beds of Blue Stone, with a cast of Red, interlaid with thin Clay Beds through ten feet of depth, and having below them ten or twelve feet of Yellowish Clay, with irregular Beds of Blue Stone in it, very cavernous or uneven on their surfaces, has long been worked and separated from the Limestone of very different qualities above it, as observed page 411.

Stoney-Middleton: here are Quarries in the 1st Lime Rock, and Kilns, whence Lime is conveyed on the Turnpike-roads to the N E and E.

Swarkestone, N E: at Cuttle-bridge Wharf on the Trent and Mersey Canal, there are Kilns for burning the *Crich* Stone; and a Lime Shed has been erected, under which Boats can lie to load in the dry. Messrs. Edward

Edward Banks and Co. here sell their Lime at 3*s*. 9*d*. per quarter of eight bushels.

Swincoe Bank, Staffordshire, 1½*m*. N W of Hanging-Bridge on the Dove: here Shale Limestone is dug and burnt.

Teversall, 1 *m*. N, Notts.: at Wood-Nook, the blue beds of Stone in the Yellow Rock are dug, but applied only to Road-mending, I believe, page 409.

Thirkelow-gate, in Hartington Parish: at a western point of the 4th Lime Rock, nearest to the Grand Ridge, and whence a Road was at the time of the Inclosure made, crossing the Leek and the Congleton Roads, and into the Macclesfield Road; which cross Road passes near the Thatch-marsh and Goyte-moss Collieries, and connects with the Roads to several others: circumstances which have, I think, pointed out this place, as a proper site for the principal Lime-works to supply the Country to the W and N W, as already observed, p. 424.

Ticknall, E of the Town: here a great many dark grey and blue beds of Limestone are dug, and burnt together, without separation, which might perhaps be advisable, altho' the Lime sold here is already in repute as a mild and useful Manure. At the time of writing the 1st Volume, I considered these (and at Calke, &c.) to be blue beds belonging to the Magnesian Rock, of Breedon, Clouds-hill, &c. but having previous to its printing, seen the Lime-works at Cribbath, Dinnas, Cyfarthfa, &c. in and near to Brecknockshire in South Wales, and considered the many points of similarity between the northern edges of the Coal-Basins or Fields of South-Wales and of Ashby-de-la-Zouch, I have nearly abandoned the

idea,

idea, of any Strata in the southern part of Derbyshire, agreeing with those on its eastern border, as expressed in my Preface to Vol. I. p. xiii. The Ticknall Works are at present in the occupation of Mr. Thomas Cope and Mr. Gilbert Hutchinson, who sell their Lime at *3s.* per quarter of eight heapt bushels, or at 8*s.* 4*d.* per ton. Great quantities of this Stone are sent away southward, by the Rail-way branch to the Ashby-de-la-Zouch Canal in Willesley, which passes through the Town of Ashby-de-la-Zouch.

Turnditch, 1*m.* S: here the upper beds of the Shale Limestone, locally exposed by a denudation in this place, are selected and burnt, to a dun-coloured Lime, which is sold at 9*s.* 6*d.* per score of 22 heapt bushels, and is in considerable repute for Agricultural purposes: the lower beds in this Quarry are pozolanic, and make very good water-setting Lime; as is usual with this species of Limestone, some of the beds explode with violence in the Kiln, when first heated. The waste Stone is stackt, and sold for Soughing or Under-draining, at 2*s.* per cubic yard and a half. The Kilns here are of the running sort, 27 to 33 feet deep, 7½ to 9 feet diameter at top, 12 feet in the belly, and 5 feet at bottom.

Twyford: at the Wharf on the Trent and Mersey Canal, Stone from *Crich* is burned, and Messrs. Edward Banks and Co. sell their Lime at 3*s.* 11*d.* per quarter of eight bushels.

Uttoxeter, Staffordshire: at the N of this Town, Lime-wharfs have been established, and Stone brought from *Caldon Low*, since the completing of the extension of the Caldon Branch of the Trent and Mersey Canal (from near Newcastle-under-Line), from Froghall to this place; and it is hoped, that the further

ther extension of this Canal southward, so as to join the main Canal again near Horninglow, will soon further extend the great benefits of Coals and Lime, &c. to Tutbury, and a circle of country round it, in Derbyshire and Staffordshire.

Walls in Whitwell: N of this Village Mr. Henry Bowden, of Southgate House, has lately availed himself of a local Denudation, which had exposed the blue beds in the Yellow Lime Rock, and opened a Lime-work (as already mentioned, p. 410), which is likely to prove of great advantage to the neighbourhood and himself. He has also intentions, I am told, of opening a Pit on these beds near to Mr. Scholefield's at Knitaker, p. 425.

Wensley, NE, near Darley Bridge: Dan's Lime-kilns here supply Lime, from a small detached part of the 1st Rock, to the Farmers eastward.

Weston on Trent: at the Wharf on the Trent and Mersey Canal, *Crich* Stone is burnt, and Messrs. Edward Banks and Co. sell their Lime at 3*s.* 11*d.* per quarter of eight bushels.

Whaley-Bridge: at the Wharf at the head of the Peak Forest Canal, Limestone of the 3d and 4th Rock is brought down the Rail-way from *Barmoor* and *Dove-hole* or Black-hole Quarries, in the Peak Forest, to Bugsworth Wharf, and here burnt and sold.

Wild Park, 1¼ *m.* SW of Muggington: here in a Red Marl district, a Rock of Limestone suddenly makes its appearance, curiously contorted, which I took at first to belong to the Yellow Lime Series, probably; but now, as in the case of Ticknall and Calke, &c. mentioned, p. 430, see considerable reason to doubt of this identity. Blue and grey Stone in beds, interlaid with yellowish Clunch, &c. are here burnt to a

hot

hot Lime of a dark colour, which is sold at 9*s*. 6*d*. per score bushels: sixty bushels per acre is enough for a dressing: it takes much Water to slack it, and as a Cement, won't set with a small quantity of Sand, but with four of Sand to one of Lime, well incorporated, it sets uncommonly hard in rough-casting Walls, as may be seen at the House of Mr. William Cox of Culland, who is Agent for S. C. Pole, Esq. the Proprietor of Wild Park.

Willington: at the Wharf on the Trent and Mersey Canal, *Crich* Stone is burnt, and Messrs. Edward Banks and Co. sold their Lime here in 1808 at 3*s*. 11*d*. per quarter: in 1809 Mr. R. Harrison of Ash told me, that he paid 4*s*. 2*d*. here, per quarter of eight bushels.

Wirksworth, ¼*m*. W at Yoke-cliff, and ½*m*. N at Middle-Peak: at these places the 3d Rock is burned for supplying Lime to the Farmers S and SE: at the former Quarries the Limestone is dark, and stinks much on being struck: the Lime is mild, and in much repute with the Farmers.

Woodthorp near Tupton: 1st Limestone, brought from Mr. Joseph Butler's Quarry in *Ashover*, p. 416.

I shall now proceed to mention, in the order of the places, such further accounts of the *Private Kilns* used, and expenses of burning Lime, by the Farmers of this County, the quantity and manner of applying it, &c. &c. as my Notes furnish.

Ash: Mr. Richard Harrison, on Red Marl, has tried 90 bushels per acre of Breedon Lime, on Swerd, but found that it did not encourage the better Grasses, but made Twitch and Thistles prevail, where it was laid: he uses Crich Lime from Willington Wharf.

Bakewell: Mr. William Greaves finds Lime, laid on Grass-land, to descend and get in a few years below the roots of the Grasses, and therefore it don't answer so well as on Arable, where it can be repeatedly brought to the surface.

Barton-Lodge: Mr. John Webb, in a series of Experiments on Liming (one of which is related, p. 121), on a Red Marl soil, in a Field of seven acres, that had been well fallowed after Beans, in August 1808, laid Birchwood-Park Lime, as soon as it had been slacked, on the greater half of the Field, in different places, at the rate of 60 bushels per acre, and about the 10th of October sowed it with two bushels of Red Seed-Wheat, broad-cast under-furrow, after laying five or six weeks undisturbed: on another part of, about half an acre, that was limed as above, only one bushel of the same Wheat was sown: another half acre of the Field was limed at the same time with 120 bushels of the same Lime, and sown with two bushels of Seed per acre: and two other half acres in different parts of the same Field, were neither limed or manured at all, but were sown at the same time, and with the same quantity of Seed, as the last. In August 1809 there was no perceptible difference in the strength, thickness or quality of the Crop: the whole was good for the season, and yielded, perhaps, 28 bushels per acre.

Bentley: Mr. Philip Oakden, of the Hall, uses 120 bushels of Birchwood-Park Lime on his Fallows for Wheat: too large quantities of this Lime does harm: he never uses it on Pastures, but in Composts.

Blackwall: Mr. John Blackwall uses Lime slackt and wet, in a mortared state, to spread on Heath or very rough old Sward, which it is wished to reclaim without

without ploughing; and mentioned, that in this state, *smeared* on to the surface, it is found, in Edale and other places, vastly more efficacious than fresh powdered Lime, or Flour, as the Farmers call it.

Blackwell: Mr. Joshua Lingard has of late years used Pye Kilns* on his Farm, having found the small running Kilns used by Farmers, to require one bushel of small Thatch-marsh Coals, to make two bushels and a half of Lime, and sometimes only two, such occasioning great waste of Coals in Winter Nights, to keep them in, by what is called raking, or making them up in the Evening (as mentioned at *Caldon* and *Marple* above). In a large Lime-pye of 6000 bushels, one bushel of the same Coals will make three to four bushels and a half of Lime, or three and a half on the average. Where there is already a Stone-pit in a Field, a Lime-pye may be prepared for charging, from two to four guineas expense, and much cartage will be saved, by its being more centrically situated, than is often practicable with fixed or running Kilns: by a Lime-pye, as great a quantity of Lime can be carted on to the Land in four or five days, as from a Run-kiln, of the usual size on Farms, in four or five weeks; since such seldom draw more than 180 to 200 bushels per day. The getting of the Stone, and charging a Pye-kiln, and drawing and loading of the Lime into Carts, is usually let by Mr. L. at 2*s*. 3*d*. to 2*s*. 6*d*. per score loads, or 60 bushels, and the spreading at 7*d*. per score. Stone dug some time, seems to require rather less Coals to burn it, and the Stone of old Walls, which has been very long exposed, rather more Coals, than fresh dug Stone does.

* The construction of these, at *Newhaven*, will be explained further on.

 The

The laying of Lime on the Sod Ashes of pared and burnt Land, was very little practised until six or seven years ago, but has now become general about Blackwell; 120 to 180 bushels (150 on the average), perhaps, are spread per acre for Turnips; after which two crops of Oats are taken, which Mr. L. thinks, by pulverizing the Turf, answers better, except on very poor soils, than one Oat crop, in the effect on the following crops of Grass. In 15 or 20 years, the Pastures here grow mossy, and require improving by Tillage, Mr. L. says. On this subject I have already expressed my opinion in page 401. Mr. L. showed me a very poor piece of Land on Cawton Hill, a red, clayey, and fox-earth soil, full of Toadstone Bolders, and wet, whose improvement he had attempted, in two ways, several years before: part of it he limed pretty freely without ploughing, but the Herbage was little improved by it, and is now excessively coarse and unprofitable; on other parts, that were pared, and burnt, and limed, the Herbage is seen considerably improved.

Bradburne: Mr. —Wright practises the Liming of his Arable Land, in the Autumn or Winter, intended for Lent Corn next Spring.

Bradby-Park: Earl Chesterfield never makes a dead or naked Fallow on any of the various soils in his Farm, and uses Lime thereon, only occasionally, 5 tons, or 140 bushels from Ticknall, when the soil is judged to require it: conceiving, that Lime is often used as of course, and does little good.

Brailsford: Mr. Edward S. Cox uses Lime, only on his Fallows, for Cabbages and Turnips.

Buxton: about the year 1783 the late Duke of Devonshire caused a considerable tract of heathy 4th Limestone

stone Land, to be improved, under the direction of his Agents, Mr. Robert Longsdon and Mr. George Brassington, by spreading 1500 bushels of Lime per acre, on Hind-Low, Sticker-Hill, and others, N of Briarley, near to Hill-head Farm, the charge amounting to 2*d.* per bushel, including leading and spreading; some doubts have, however, been expressed, of the propriety of some parts of this charge to His Grace: the effect, however, tho' slow, was striking; the Heath being exterminated by the Lime, a sweet and good Herbage has succeeded, and kept its place, while Briarley Hill, near there, remains in the same heathy state as these Hills were, and marks strongly, the improvement that has been made. Mr. Thomas Logan, late of Buxton, is reported to have since succeeded in the extermination of Heath on these Limestone Hills, by no more than 200 bushels of Lime, and others with 300 to 600 bushels per acre; but the operation has been so slow and tedious, in most cases, being sometimes 20 years before the Land *broke*, as they call it, and produced a kind Herbage, that Paring, Burning, and Liming, is now generally resorted to, as I have explained in Sect. II. and herein.

Chatsworth: on Shale Gritstone Land, opposite Chatsworth House, on the W side of the Derwent, 260 bushels of Lime per acre were spread, on the parts covered by Fern, and a striking improvement effected; but its further extension was stopped, on the representation of some one, that Swerd so improved, would make the Deer riggle-backt! His Grace's inclosed Pastures are occasionally dressed with 300 bushels of Lime per acre.

**Chelmerton:** here small Pye-kilns have been in use,


since

since about the year 1788. Lime, at the rate of 900 bushels per acre, was laid on 2d Limestone Land, over-run with Moss Hillocks, on Chelmerton Low. At the Inclosure of the Common, Pye-kilns only were used by the Farmers, and Mr. Joshua Lingard of Blackwell informed me, that he considered it as certain, that ten times as much Lime had been then used, as would have been, if Run-kilns had remained in use, on account of the superior cheapness and expedition of the former, in preparing this important Manure.

Croxall. "Grass Land, very full of Twitch, Mr. Princep has greatly improved by Liming, with 72 bushels per acre of Ticknall Lime, at the beginning of winter."

Culland. Mr. William Cox has tried both Breedon and Wild-Park Lime, on his Red Marl Soil, and although they are similar in colour, and both do injury, where laid in heaps or spread too thick, they are, he thinks, of different kinds.

Eckington. Several Farmers here, use 50 level bushels of Peck's-mill Lime from Killamarsh, per acre, on their Fallows, repeated every four or five years.

Glossop. Great part of the Farmers here, use Lime from Marple Kilns, principally on Swerd, on Coal-measures, at the rate of 40 to 60 Horse-loads, or 120 to 180 bushels per acre, and find it answer better thus, than on their Arable Lands.

Hardwick-Hall: The Stoney-Houghton Lime, when tried here, has not occasioned the Seeds to stand, or the Clover, &c. to last, so well, as when Crich Lime has been used, according to the information of Mr. John Cottingham.

Hanson-grange: Mr. William Gould, here made very early

early use of the Pye-kilns, that seem increasing so fast in the Peak Hundreds.

Hargate-wall. Mr. Ellis Needham limes extensively, uses Pye-kilns, and can lay on Lime thus burnt, at 8*d*. per bushel, or under.

Ilkeston: Mr. Samuel Cocker, on his Fallows for Wheat, on strong Clay and light Yellow and weak Land on Coal-measures, lays 120 bushels of Crich Lime per acre, and for Turnips 120 bushels, and 12 three-horse Cart-loads of rotten yard Dung, or of Ashes, Privy Soil, &c. from the Town.

Kniveton: the Rev. William Hurd, prefers Lime for Land, after being long exposed to the air, and has seen Mortar from old buildings do more good than fresh Lime. On Land that had borne two Crops of Oats after having been old Swerd, he spread 100 bushels per acre, in the Spring harrowed the Lime, and sowed Oats on one ploughing, which proved a better crop, than an adjoining piece under the same circumstances, except that it was limed in the Spring, spread, and the Seed harrowed in, after one ploughing.

Longford: Edward Coke, Esq. uses 80 bushels of Birchwood-Park Lime per acre, on his Fallows, for Wheat and Beans.

Lullington: Mr. Thomas Moore uses on his Stubbles or Fallows, either 96cwt. of Ticknall Lime, or 48cwt. of Breedon Lime, and sometimes 64cwt. of them mixt, in equal proportions per acre.

Markeaton: Edward N. C. Mundy, Esq. limes for his Turnip Crop, with 84 bushels of Ticknall or Turnditch Lime, in addition to eight three-horse Cart-loads of Dung per acre. On old Pastures, thin of soil on strong Red Marl, Mr. M. has used

200 bushels of the above Limes per acre, with beneficial effects.

Meadow-Place: Mr. Richard Gregory has reclaimed great tracts of heathy 1st and 2d Limestone Lands, by Paring and Burning and Liming: of late, Turnips have followed this process.

Newhaven: Mr. Timothy Greenwood uses a great deal of Lime, and burns it in Pye-kilns, or Pudding-pyes, as some call them. His process is as follows:

In a Stone Pit, if on an eminence rather, and open to the West the better, for saving carriage of the Lime, and procuring more draught of air, and if Carts can come into the West side of the Pit, still better, as then the Pye is to be constructed along the Eastern side of the Pit: those I saw were thus situated, and sixteen yards long, six yards wide at top, three quarters of a yard wide at bottom, and three yards deep, shaped much like a Boat, with swelling ribs; the sides of the Pit having been roughly cut or quarried, to form the East side and the ends, and the West side formed with a rough wall of Limestones: three openings or door-ways being left in the length, in building this Side-wall, which openings are built up with Stones, previous to charging the Pye. Along the bottom of the Pye, a Channel is formed about half a yard wide, and as much deeper than it, like the keel of a Boat almost, and from this, three similar channels branch, to pass under the three openings or door-ways; these are for admitting air, and lighting the Pye: whose previous preparation for charging as above, has cost Mr. G. from 60*s*. to 70*s*.

Preparatory to charging the Pye, the Trenches above mentioned are covered over by dry branches of Wood, and

and Heath or Straw spread upon these, to receive a floor or layer of Coals three inches thick, all over the bottom of the Pye: then six inches thick of Stone, broken rather small, is spread on this; then another three inches of Coals, succeeded by a seven or eight inch layer of Stone, which may increase in size of pieces to the middle, where they may be pretty large, if set up edge-ways. In the above manner the alternate layers of Coals and of Stone are continued, the latter increasing in thickness to 14 feet above the bottom, along the middle of the Kiln, and the last layer of Stone may be 14 inches thick, and should be pretty well broken, and the top layers should diminish above the walls, so as to form a regular surface, almost like a Boat five feet deep, turned bottom upwards. This surface is then to be covered with Sods, laid with the Grass inwards, and lapping close over each other, except along the ridge at top, to about six inches thick.

Lighted Straw or dry Heath is then introduced to the middle of the Pye bottom, by means of the three side channels, and the Pye is left to burn for five days, if good Coals from the Wharf at Cromford are used, or ten days if the Thatch-marsh Coals are used: one or two days more are generally enough to cool the Lime, sufficiently to begin drawing; which commences, by backing the Carts against the side wall, and the men with Shovels throw the Lime into the Carts, until got some distance below the side Walls; the temporary Walls in the three openings or Door-ways, are then removed, and a Cart backed to each, enables the remainder to be readily drawn and loaded.

Twenty-five tons of Coals thus applied, make 80 three-horse Cart-loads of good Lime, of about 30 heapt bushels each: a Pye, dressing about 20 acres, at

at the rate of 120 bushels per acre. Mr. G. did not seem to be aware, of any larger quantity of Lime being procurable from a ton of Coals in this way, than by using Running-kilns, but considered the saving in time and expense as very considerable, with Pyes.

The Ashes of the burnt Land being spread (see page 404), the Lime when carted on to it from the Pye as above, is laid in heaps, of about a bushel and half each, as tight and round as may be, and is left in that state two or three days to fall into flour, which is then spread, and a Norfolk plough, drawn by two horses, immediately follows, with about a two-inch furrow; and during June, or the first week in July, 1 lb. of Turnip Seed (Norfolk Whites, or Green Tops) per acre is sown, and harrowed in. On these new Lands, Mr. G. found the Turnip crop patchy, and did not adopt hoeing, in the early periods of his thus breaking up the Common Lands, around Newhaven Inn. On one of the new fields that had been pared and burnt, and Turnipt without Lime, Mr. G. spread on part, rotten Stable Dung, and sowed Lentils, and limed the other with 150 bushels per acre, for Oats: next year the whole bore Oats, and had Red and White Clover and Rye-grass sown with them: in the following year, the limed part proved much the best Crop of Grass, and continued so for two years, when the unlimed part was dressed with Road Dirt.

Norbrigs: Mr. Joseph Butler has tried Lime from the blue beds in the yellow Rock, at Bolsover Quarries, at the rate of 40 bushels per acre on Wheat Stubbles, following Paring and Burning on old Ley, for a crop of Pease: and tried against it, Peak Lime from Calver, 40 bushels per acre, and saw no perceptible difference

difference in their effects on the Crop, except that the Bolsover Lime seemed rather to encourage Weeds, which he has been told, that Lime from the redder yellow beds of that Rock do, to a high degree.

Palterton: Mr. George Bell, on the Coal Shales below the Hill, finds the Lime from the blue beds to answer well, as it does also on the yellow Limestone on the Hill, at the rate of 40 to 48 bushels per acre: tho' 20 bushels only is there used, by many of his neighbours.

Perry-Foot: Mr. Robert Needham, on 4th Limestone Pastures, much subject to a fox-earth beneath the mould (Vol. I. p. 305), has twice limed, at intervals of 20 to 30 years, at the rate of 210 to 300 bushels per acre each time, in the winter season, and has found the larger quantity did the most good.

Pilsbury: Mr. Joseph Gould, in order to increase the depth of a running Kiln that I saw here on his Farm, and yet allow Carts to back, and have their bottoms level with the floor of the passage from the drawing-holes, makes this floor longer than usual, and inclined, but not so much, but the labourers can wheel barrow-fulls of Lime up into the Carts, by which the drawing of the Kiln was much facilitated. Mr. G. in an extensive use of Lime, on pared and burnt land, 120 to 150 bushels per acre, has found, that the parts where short Heath had grown, after two crops of Corn, became much infested with *Chickweed*, on the 4th Lime Rock.

Stanesby: Edward S. W. Sitwell, Esq. uses on his fallows, on Coal-measures, 64 bushels per acre, of Crich Lime.

Stanton in the Peak: Bache Thornhill, Esq. on his Pastures,

Pastures, where mossy (on Limestone Shale or its Grit, strewed with blue and bastard Limestone bolders in places) spreads in April, 30 to 35 Loads (each three heapt bushels of 34 quarts) of Lime flour, as soon as slacked hot from the Kiln, thrown from a Cart by shovels. His Arable Land, on Shale Grit, is limed in August, on the fallows, 30 to 45 Loads per acre, spread as above, and ploughed in immediately: for Turnips 25 to 30 Loads is spread, early in June, and 14 to 21 days after, seven to nine three-horse Cart-loads of Dung are spread, and ploughed in immediately, and on the same day Turnips are sown broad-cast; for if the Dung has time to get dry before sowing, the Turnips are apt to fail.

Stanton Ward: the late Mr. Fletcher Bullivant, on the Coal Shales, on a naked fallow for Wheat, spread 120 bushels of Ticknall Lime, and in the Spring harrowed in 14 lb. of Red Clover, and two pecks of Rye-grass Seeds, to lay two years; then Oats, followed by Wheat: and on the Gritstone or Gravel Soils, 120 bushels of Lime, and 30 tons of rotten Dung per acre for Swede Turnips; then Barley, with 14 lb. of White and 8 lb. of Red Clover, to lay four to six years, fed the first of these; then Barley, and sometimes Wheat after it.

Sudbury: Lord Vernon, on his fallows on Red Marl, spreads 100 bushels of Birchwood-Park Lime, per acre, just before sowing either Turnips or Wheat.

Weston-Underwood: the late Mr. John Wall used Turnditch Lime, laid in a large heap two or three months before using, turning it in the mean time to slack it effectually: on Lands but recently broken up, 70 or 80 bushels per acre, spread on the Turnip or

Wheat

Wheat fallows, a week or more before sowing; ploughing twice after spreading before sowing Turnips, and once before sowing Wheat. Upon old ploughed Land, 70 bushels of Lime and eight four-horse Cart-loads of Dung per acre, without which last, the Lime here did not answer. On some of his Pastures, he spread, in the middle of August, 100 to 120 bushels of Lime flour, and did not practise the making of Lime composts for Sward.

*Limestone Broken.*—I heard of no attempts in the County to break down Limestone for Manure, and very few instances of its being so used, when ready broken by the wheels of Carriages, on the Roads mended with Limestone. Mr. Timothy Greenwood, of Newhaven, on his Artificial Grasses, that had been Dunged but not Limed, as has been mentioned, page 412, spread 14 or 15 Loads per acre of the shovelings of the Turnpike Road, laying in heaps by its sides, composed principally of ground 4th Limestone, which astonishingly improved them; and two years afterwards, when it came to be broken up with the other, and limed part of the field, the Crop of Oats proved much the best on the Road-dirt part: and Mr. G. was intending to pursue the use, of this hitherto neglected Manure. Mr. William Needham of Great Hucklow, makes compost of Road-side Soil (Limestone ground) and Lime, for his Oats.

It has often struck me, in travelling on Limestone Roads, in dry seasons, thro' a stratum of Dust almost as fine as Hair-powder, and almost as easily moved as a fluid, that it would amply answer to the Farmers to collect it in this state, to spread on their Lands: and that it even would answer to persons near such

Roads,

Roads, who would collect it in every dry season, and preserve it in that state under sheds, for sale to the Farmers, when the state of their Lands, and leisure from other urgent business, better admitted of their fetching and applying it: for it must not be supposed, that after heavy rains have fallen, and washed away all the finer parts of such Dust, including most of the dung of Horses, &c. dropped on such Roads, and above all, after being scraped up and laid in heaps, and had time to dry, and set like mortar, that this Road-dirt possesses nearly the fertilizing properties of the impalpable calcareous dust that I have mentioned above, and which, from its minute state of division, might be so readily and perfectly incorporated with the soil.

*Of Limestone-Gravel*, the quantities are exceedingly small in this County, if we except the *Slitker*, or Angular Limestone Rubble scattered on the sides of some Valleys in the Peak Limestone Districts, mentioned Vol. I. p. 145, and all that there is, is of that permanent and indestructible nature, either as hard rubble or rounded pebbles, as to be utterly incapable of acting as a Manure, without first burning or pounding: and considering the frequent mention of this substance, *in Books* treating of Manures, it may seem rather surprising, that I have never any where met with Limestone-Gravel that was, or could be so applied.

*Clay*: except of those sorts, which from their calcareous admixtures, have been denominated *Marls*, and are mentioned at the beginning of this Section, I saw no instance of its application in the County; indeed from the small quantity of real Sand Land in the County, owing to the general prevalence of Argil

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in the cements of the Gritstone Rocks, which make light loams by their decomposition, it seems little wanted. On the south side of Wessley, I saw the clay of the Budler's Sludge-ponds (Vol. I. p. 377), carted on to the Limestone Pastures near them. On the S E of Glapwell, I saw the thick water from the yellow Limestone Roads, collected in small ponds by the sides, to deposit its sediment, in a fine Clayey form, which the Farmers carefully dug out in dry weather, and mixed with Dung for their Lands: the proportion of *Magnesia* that this clay must undoubtedly hold, shews, that the same cannot be as destructive to vegetation, as Mr. Tennant a few years ago maintained. See page 185.

*Sand.*—At Blackwall, Mr. John Blackwall's Farm is principally upon cold Limestone Shale, but part of this stratum is covered by Hummocks of very sandy Gravel: this last Mr. B. has carted, and incorporated with the strong soil of the other parts, at the rate of 200 loads per acre, at the time of Fallowing, and the improvement it effected fully answered his expectations. In other situations, this might be imitated with like success, I think.

*Gypsum:* altho' this substance is dug in such considerable quantities at Chellaston and Aston, as observed Vol. I. p. 149, and might be had in no very small quantities, almost in a powdered state, from the Turners of Gypsum Ornaments, called Petrifaction Workers, I. 461; I could hear only of three persons who had given it a trial, as a Manure; viz. Mr. George Nuttall, who tried it at Matlock, both on 1st Limestone Pastures, and on Shale Pastures, spread at Michaelmas:

chaelmas: on both it encouraged the growth of White Clover, and did good; Mr. James Longsdon, of Longsdon, but not with much success, I believe; and Mr. John Bunting, of Bunting-fields in Ashover, who in 1809 tried it on alternate lands of Oats and of Turnips, with no visible effect. In America, where this substance is so extensively used, I read, that they don't find it improve cold clay, or ochrey soils, and that it must be pounded, and then ground fine in a Flour-mill, and *not burnt*, to reduce it to powder, as in that case its fertilizing effects are destroyed or nearly so.

*Pond-weeds and Mud!* the use of these by Mr. Robert C. Greaves, at Ingleby, and by Earl Chesterfield, at Bretby, has already been mentioned, p. 187: in the excellent improvements of John Beresford, Esq. at Osmaston Cottage, in Shirley, a smaller Pond, which he calls a Mud-trap, was constructed above his large Fish-pond, and from which he has carted 2000 Loads of rich mud, and an accumulation of rotten Weeds, on to the gravelly Hills adjoining, which have been greatly improved thereby.

*Burnt Earth* or Clay, is little used here, except from the thin sods mentioned in Section II. on Paring and Burning, p. 400, and where the late Mr. Joseph Wilkes's exertions in this way on Ashby Wolds and in Measham, are referred to.

*Ashes.*—Except in some of the northern Parishes of the Peak Hundreds, where Peat is used, Coal is the universal fuel of the Inhabitants, in whose Grates, as well as in the numerous Steam-engines and other fire-places in the Manufactories, vast quantities of *Coal-*

*ashes*

*ashes* are of course produced, and few things in Derbyshire surprised me more, than the almost universal neglect of these, as a Manure (as already hinted, page 186 and 414): accustomed, as I have been, to see them *so highly prized* in all the Southern Counties, and collected and carried such great distances from London, in Carts and Waggons, and still further by the Canals and Navigations. How happens it, that here in the South, Lime is in no repute with the Farmers, and Coal-ashes so much valued, and that in Derbyshire the reverse in both instances is the case? I have seen or heard no sufficient reasons. In Measham and at Bradby-Park, Coal Ashes are used as mentioned p. 186, and by Mr. Samuel Cocker, of Ilkeston, p. 439.

*Soot.*—This article also seems to be sought after, with little of that avidity which it excites in the southern Farmers: Mr. Beighton, of Hulland Ward, uses it: Mr. Samuel Cocker, of Ilkeston, on Wheat in March: Mr. George B. Strutt, of Belper, on Grass Land, &c.

*Bones:* If Middlesex Farmers may wonder to be told, that Coal-ashes are disregarded in Derbyshire, they can scarcely be less surprised to learn, that several Ship Loads of the Bones, collected in London (some from the Church-yards, as I have heard), find their way into the interior of Derbyshire annually, and are there ground by Mills, erected on purpose, into a most potent and valuable Manure. *Bone-mills* have been erected in Ashford, Beighton, Bonsal Dale (the Slag-mill Rollers at Viagellia Cupola), Dunston, Killamarsh (the Forge Hammer), Makeney,

(at the Iron-works), Shipley Colliery, (a Hammer worked by the Engine Pump-rod, formerly), Walton (or Brampton Moor), Whittington (Sheep Bridge, &c.) At the last-mentioned Mill, Mr. Henry Bason is supplied by the Chesterfield Canal Boats, to Wilden's Mill, and sells his ground Bones at 2*s*. 3*d*. per heapt Bushel, six or seven quarters being used as a dressing for an acre of Land. This Mill is moved by water, and its operative part consists of ratchet-like iron wheels or rollers, between which the back bones of Horses, with their adhering ribs, the cores of Ox-horns, &c. pass with facility, and are crushed into small pieces.

It might have been supposed, that the Grease, &c. in the Bones, contributed principally to their fertilizing effects, but when I was in the neighbourhood of Walsall in Staffordshire, in 1809, I was told by a Farmer, who as well as many of his neighbours used Bone Manure for their fallows, on either clay or sand, at the rate of 80 bushels per acre, which cost 15*d*. per bushel: that at some of the Bone-mills there, they had Caldrons for extracting all the Grease from the Bones by boiling, and that they rather preferred such cleaned Bones, as not liable to be carried away by Birds or Vermin, or to attract Insects: that the effects of such last for 20 years, but if often repeated on Arable Land, the Corn is apt to run to straw. Some have thought, apparently, that it was not necessary to crush or break Bones into small pieces for Manure, for when I was at the Duke of Portland's Park, at Welbeck, Notts, I saw considerable Lawns therein, strewed with large fragments of Bones, skulls of Horses for instance, only once or twice broken, which being bleached by the weather, had a most unsightly appearance, and it appeared

peared dangerous to ride among their sharp-angled fragments. My Notes on the use of crushed Bones in this County, are as follows, viz.

Ashover: Mr. John Bunting, of Bunting-field, has tried them with little effect, except on his Turnip Crops, whereon he used 100 bushels per acre, which cost 20*d.* per bushel.

Belper: Messrs. Strutts encourage their Work-people to preserve and collect Bones, and buy them by Wheel-barrow fulls at a time, of the Children or others, at 1*s.* 6*d.* per cwt. and have them broke at Makeney Forge, for their Pasture Land. Mr. William and Mr. Samuel Ward, also buy and use Bones on Pasture Land.

Bolsover: the Rev. Edward Otter here uses London Bones, crushed, 80 bushels per acre, which cost at Norbrigs Wharf, 2*s.* 3*d.* per Bushel; and he, as well as his neighbours who use them, find a crop of Turnips better secured by their use, than by any other Manure, except Privy Soil.

Eckington: here Bone Turnings and Chips, from the Sheffield Knife-handle makers, are used by several Farmers.

Heanor: the late John Sutton, Esq. used Bone Manure, pounded under Hammers.

Horsley: Mr. Paul Fisher, at Horsley Park, uses a good deal of Bone Manure.

Openwood-gate: Mr. John Spencer, highly improved a Farm here by Bones, bought and pounded at Makeney Forge.

Swathwick: Mr. Joseph Butler here, on mossy old Ley of 25 years standing, on the Coal-measures, used per acre, 36 bushels of Bones pounded by his Kil-

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lamarsh Forge Hammer: he contrived to lay them on in a rainy day, which improved and entirely altered the herbage, especially after a second dressing of 24 bushels per acre, at the end of seven years: and for nineteen successive years this Land bore a good crop of Hay, without other Manures. For Arable Land, Mr. B. don't think Bones much preferable to Lime or Dung.

Whitfield in Glossop: Mr. John Kershaw, of Hurst, uses Bones, on Clayey Limestone-shale Grass Lands, fetched from the Bone-mill, at Hyde, near Duckenfield, Cheshire, and finds them answer well.

*Horns*: those who have noticed the vast quantities of the Bony Cores of Ox Horns, that are either thrown away, or used in building disgusting fence walls in the vicinity of many large Tan-yards in the south of England, will be glad to find, that when crushed and broken small in Mills, these prove so valuable a Manure as is mentioned above. Horn Turnings and refuse from the Sheffield Cutleries, are used at Whittington, as well as from their own Horn and Bone *Button-mould* Manufactory.

*Ploughing in Green Crops.*—It has often occurred to me, from seeing the very luxuriant growth and large produce of some Weeds, and the facility with which their seeds might be collected, as of the Fat-hen or Wild Spinnach (*chenopodium*) and others, that such might be beneficially cultivated, as crops to plough in: on mentioning this idea to Mr. Thomas Harvey, of Hoon-hay, he objected to the Fat-hen, that its roots run near the surface, and it would exhaust the vegetable soil. Mr. Philip Oakden, of Bentley Hall, reserves

serves the aftermath or edishes of his Clovers, for ploughing in, about the end of August: which he lets lay till Spring, and then harrows in Beans, or sometimes Wheat, and finds great benefit from the practice, on a Red Marl Soil.

*Town Dung*: this, as I have already remarked, in speaking of Weighing-engines, page 64, is now pretty generally sold *by weight* from the Towns in this County: its price at Matlock-Bath in 1808, weighed at the Road Engine, was 7*s*. per ton: in Ashburne about the same. The Scavengers of Derby Town, sell their Sweepings of the Streets, partly at 6*s*. per Three-horse Cart-load, to the Farmers about Mackworth, and send the remainder to more distant places southward, by the Canals, as an alloy to *Privy Soil*, as observed, page 186, which last effective Manure, is used at Bolsover and Ilkeston on fallows for Turnips, in Norton, &c. The stimulating effects of this and Soap-suds, and other produce of the Sewers in Belper, on Mr. Joseph Gratian's Garden, have been mentioned in page 209. For preserving the valuable Manure of the Sewers in some lower parts of that Town, Mr. George B. Strutt has lately constructed a large circular Dung-hole near to the Cotton-mill, as a general receptacle for Dung, Weeds, &c.; the floor of which is paved with a slight descent on all sides, and grooved to a Cespool or Well in the centre, where the different Sewers meet, and in which an Iron-pump is fixed, which, with its long trough or lander, extending to the circumference or circular wall, and resting there on a set of rollers running on a projecting stone course in the wall, can easily be turned round, so that from small holes in the bottom of the lander, every part of

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the surface of the dung may be wetted daily, with the liquid manure from beneath. Mr. Samuel Oldknow, from the Kitchen of his Cotton-mill Apprentice House, the Privies of his Works, &c. has laid Drains to a Cess-pool or Well, whence a Chain-pump lifts the soil into Water-carts, which distribute it on to his Grass-lands, or into landers which convey it to irrigate such as are properly situated for it: and one of which might be made to cross the River, and induce on his excellently managed Sale Garden (page 208), a degree of fertility and luxuriance of produce, not inferior to Mr. Gratian's, there mentioned; and all the Dung now expended on this Garden, might go to increase the fertility of his Farm. Earl Chesterfield, in his new Farm Premises in Bradby-Park, has a Tank below the Yard, for collecting the Urine and soakage of the Cattle-Stalls and Dung-Yard, and was making an inclined passage down into this Tank, so that such part of this liquid as was not needed for sprinkling the Dung heaps in the Yard, might be carried on to the Grass Land, by a low Water-cart, backed into it, having valves opening inward which will allow it to fill, but shut close as soon as the Cart is drawn up the inclined plane.

In Peak Forest, I observed the practice, of throwing Lime frequently, in small quantities, down their *Privies*, to prevent their stench: perhaps a better practice, where there is not an opportunity to wash out the soil for irrigating Grass Lands, in a very diluted state, as will be mentioned in the next Section, is to sprinkle down frequently, some pulverized earth or mould, the more dead or free of vegetable or fertilizing impregnations, as that taken from below the surface mould generally is, the more effectually will the

stench

stench be absorbed, and much valuable Manure will be prepared in a dry state, such that it can be dug out and spread, without those inconveniences which are the principal bar to the use of this highly valuable Manure.

*Yard-Dung.*—On this subject, many particulars have already been mentioned, in treating on manuring Meadows, page 184. In the construction of the new Farm Premises on the Hill in Mr. Joseph Gould's Farm at Pilsbury, he has been careful to lander, or make Water-troughs to the eaves of all his Buildings, to prevent their water from drenching the Dung preparing in the Cattle-yards between them; and by means of which, a Meer, or Artificial Pond (see Vol. I. p. 494) behind the Buildings, and securely fenced, is always supplied with water, to be pumped into the Cisterns and Troughs for the Cattle. In the complete Farm-Yard of William Drury Lowe, Esq. at Locko-Park, brickt Dung-holes are constructed, and Drains beneath, collecting the soakage to a Well, where an Iron Pump is used for returning it upon the Dung, or filling it into Water-carts for manuring Grass Lands. Earl Chesterfield's Dung-holes in the Farm-Yard at Bradby-Park, are so contrived, that they are never carted upon, or a road or passage made over them, which improperly compresses the Dung. Sir Robert Wilmot's Dung-holes at Chaddesden are well contrived.

In some few places in the County, a slovenly and most improper mode is adopted, of making Straw into Dung, that of littering it in the Town Street, or in a Public Road, as I noticed in part of Bolsover, at Hanley in North Winfield, Plesley, &c. and which practice, it well becomes the Magistrates and Surveyors of the Roads to suppress.

For carrying out Dung, Compost, &c. into heaps in the Field, or Stones on to Road, &c. I observed at Bradburne, Chaddesden, &c. a useful addition to the Carts, which supersedes the necessity of pummels or projecting lengths behind, of the bottom side-pieces of the Carts. A strong Hook is fixed into the middle of the Axle-tree behind it, and a stout rough piece of wood is provided, called a Drag, about five feet long, having a strong staple in its end, which, before emptying the load, is hooked on to the axle by the hook above mentioned, or let down if it had before been attached, and was looped up to the Cart-tail; and this Drag acts the part of the Pummels, when the Cart is unbarred, in preventing its tail descending too low, and shooting the whole load at once; but a proper heap can be pulled off it by the Dung-drag in the usual way; and as the load decreases in height, the Carter has only to pull the Cart-drag from the middle towards one of the sides by his Dung-drag, in which oblique position (like shortening the length of Pummel), it suffers the Cart to tilt more than at first, to facilitate the discharge of the remainder of the load: and even at first, if the load is high, by pulling off a small heap of Dung first, for the Cart-drag to rest on, the shooting of the load, before it is lightened behind, is prevented, by such keeping up the tail of the Cart, in a proper degree.

At Sudbury I noticed more than ordinary care and pains, in spreading and incorporating Dung with the Grass Lands, as mentioned, p. 188; and at Radburne, too much the reverse of this, in seeing Dung very badly spread upon tall Edish.

*Long Dung*, and fresh or rotten? The late Mr. Joseph Wilkes of Measham, used the Dung of his Horses,

Horses, long and unfermented, as is stated by Mr. W. Pitt in the Leicestershire Report, p. 191 and 192. Mr. Thomas Logan, late of Buxton, used to boast of his success with long and unfermented Dung, on Grass Lands: but from the very exhausted and foul state of his Lands when I saw them, then recently in the occupation of Mr. William Wood, and the many *hoaxes* which he is known to have passed on Agricultural inquirers, I dare not adopt his statements. Earl Chesterfield at Bradby-Park, prefers laying Dung on the Land, while in a state of fermentation, in a medium way between being too fresh or green and too rotten. Mr. Joseph Gould of Pilsbury, prefers Dung in that state of rottenness, in which it can just be cut by a Spade, in filling the Carts. Mr. Thomas Harvey of Hoon-Hay, thinks it most desirable to manure with Yard-Dung, in a state of fermentation, in moist and warm weather, and thinks frost or cold prejudicial to Dung when first spread, see page 185.

*Woollen Rags:* Mr. Paul Fisher of Horsley Park, has used these, as I was informed.

*Composts, and various Manures.*—Composts, of the various sorts used in the County, have been mentioned, as Manures for Grass Lands, page 184. In Glossop, Mr. James Robinson and Mr. John Aveson here make useful Manure for Grass Lands, from the shudes, shillings, or husks of the Oats, from the Mills where Oatmeal is prepared, an article which is too often blown away into the stream by the Fanners of the Mill, or thrown in a heap, and set fire to, in order to get rid of it. In the 16th Volume of the Transactions of the Society of Arts, the process is described, by Mr.

Brown

Brown of Derby, of quickly preparing a sort of Ashes or Compost, of green Weeds and hot Lime placed in alternate layers: and the probability is stated, that it would answer to grow crops of Clover, to be applied in this way, as Manure for other Lands.

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## SECT. IV.—IRRIGATION.

My predecessor Mr. Thomas Brown, seems to have been rather unfortunate, in the enquiries for his 4to. Report, in having hit only on two injudicious attempts, at watering flat boggy Marshes, and from their failure and disrepute, to have concluded, that the practice was going rapidly into disuse, and says, "the Coal and Minerals of Derbyshire, are certainly *strong reasons* for the water not fertilizing the Land:" I rather think that Mr. B. was misinformed, as to Irrigation having been practised "long ago," and had decreased "in many parts" of the County, at the time he wrote, in 1794; since I could hear of no considerable retrogression of this improvement: though certainly, in a County so finely adapted for its practice, its spread has been considerably delayed, by the very injudicious proceedings of a man named *Grunsil*, who about the year 1788, undertook to irrigate some Meadows for the late Hugo Meynel, Esq. at Spinneyford Brook, N of Ednaston, who seems merely to have levelled the boggy surface, and to have partly cut and partly raised Trenches or Carriages, for distributing the water of the Brook on to this flat Bog, and here and there cut as trifling a Drain, for carrying it off again: the consequence was, as might have been expected, that

that these Meadows grew rapidly more and more rushy, flaggy and coarse, as long as this mischievous practice was continued. A labouring man named *William Dowdswell*, was also brought out of the West of England, about the year 1785, and in the course of the five following years, made for Edward Coke, Esq. at Longford, 40 acres of Water-meadow, in a Valley equally flat and boggy as at Spinneyford, and with scarcely more precautions for Drainage, or to ensure the beneficial action of the water, by a proper elevation or slope of the beds or panes, than those above mentioned: and the result here also was, that though the crop of herbage was much increased, it became by degrees so coarse, as to be of no use, and the watering was discontinued. In the mean time, several other pieces of Irrigation were undertaken in the District, and their Framers, too much copied these flat meadows, at Spinneyford and Longford, to exhibit the advantages of this important improvement in its proper and striking light.

It is the furthest from my wish, in these remarks, to hurt the feelings of any one, of an honest and unassuming individual, William Dowdswell in particular, were it only on account of his two Sons, now very able professional Irrigators, whom I shall have occasion further to mention herein; but it would be highly wrong, that the cause of this most capital Improvement should suffer, for want of having the source of occasional failures therein understood, especially since the error here complained of, has spread wide, and been the obvious cause of almost every failure in the practice of this art, which I have anywhere seen. From Longford, William Dowdswell was taken into Norfolk, and made several Meadows for Mr. Bevan, Mr. Colhoun, and I believe

believe for Mr. Coke and others: but all of which were formed so flat, and were found in consequence, so subject to aquatic Weeds, that the able Farmers of Norfolk, have since received the Meadows made for them by Mr. *William Smith* (and by his late Foreman Jonathan Crook, now settled there) on proper principles, as the introduction of a new art among them, as is too well known by their published proceedings, to need my saying more, than referring those who have not seen it, to Mr. Smith's "Observations on the Utility, Form, and Management of Water-meadows," treating particularly of those in Norfolk and Bedfordshire, which he had constructed.

In the beginning of 1795, the late Duke of Bedford brought William Dowdswell to Woburn (where he still resides, and manages the water on the present Duke's Meadows), and gave it to me in charge, to set out and see to the construction of the general works, for collecting and bringing on and taking away the water, for the extensive scheme of Irrigation which he had projected, and which Dowdswell, under my directions, was to execute: it rather unfortunately happened, that the entire new letting of His Grace's Estate on a term of years, just afterwards, and shortly after that, the Inclosure of most of his open-field Parishes, made it necessary, as I shall mention further on, to enter on, and complete in part, a vast extent of *general works* for the purposes of future Irrigation, which could not have been done at any future time; and this before much, comparatively, of the surface works under Dowdswell at Woburn could be completed: a great deal was however done before the unexpected loss of His Grace, in a very good manner, principally of *catch-work*, on the declivities of the Hills, as mentioned

tioned by Mr. Thomas Batchelor in the Bedfordshire Report, page 484, in *extracts* from the "Annals of Agriculture:" yet, whenever William Dowdswell's work extended on to the boggy or alluvial Flats in the Valleys, his mistaken maxim, that such needed no previous draining or throwing up, but that water thrown over them in plenty, would consolidate and improve them effectually, too much prevailed, in spite of my remonstrance; and the improvement on these parts of His Grace's Meadows, were in consequence much less than ought to have been, considering their great comparative supply of water: and the handle these furnished to the enemies of this art was such, that for a considerable time after the Duke's decease, the watering at Woburn was altogether discontinued, and William Dowdswell employed as a common labourer, until the watering was resumed. We learn from Mr. Batchelor (where he ventures to leave his author), that Mr. William Runciman has since seen the necessity of throwing up parts of these flat and imperfect Meadows, by the Spade or the Plough (as ought in every such instance to have been done at first); and that the same has been done at Maulden also, by Mr. Thomas French, on Meadows, alike too flat in their construction: and Mr. B. adds, "the adjoining flat peaty Meadows, which were irrigated without raising them into Ridges, before the subject was well understood in this County, are of very little value." Mr. William Smith, in order to commence the improved Meadows at Prisley, a short time before the decease of the Duke (of which a particular account will be seen in his Work), entered on the Bog in the rough and desolate state, in which Mr. Elkington had left it, as mentioned, p. 366, and no Irrigation Works had there previously been

been attempted; the low flat *clayey* Meadows in Ridgemount, which Mr. B. mentions, p. 489, were certainly *less raised* (but at less cost, let it be remembered) than they ought to have been, but their abandonment was occasioned by the resumption and rebuilding of Crawley *Water-mill*, after the late Duke had built a large Wind-mill at Woburn, to supply its place, and admit of the appropriation of *the whole stream* to these Meadows, but which they never had: it is therefore painful to me to see these circumstances suppressed by Mr. B., and the fault charged *on the soil*, though in despite of positive proof, in one half of the Woburn Meadows, next Birchmoor, which (notwithstanding Mr. Young's mistake in calling them good *sandy loams*, Mr. B. p. 485) are on almost as strong and *tenacious a clay* as any in Britain, but being ancient and highly ridged Pastures, they were (with less expense than in the other parts, where left too flat) effectually done.

These digressions will not, I hope, prove useless to future Derbyshire improvers by Irrigation, by showing more clearly, the source of the only positive failures that I have heard of among them, and of all that is to be lamented in the want of the most perfect success attending the existing Meadows: and that nothing should idly be charged to their Coals, Minerals, Chalybeates, &c. but they may rest assured, that a *proper form, and plenty of Water, judiciously applied*, will make a good Meadow in any situation: and that all failures in Irrigation may be traced to a defect in some degree or other, in one or more of these three essentials of the art.

It has not perhaps occurred to many, who have been impressed with notions of the vast importance of attention

tion to the *quality of the Water* to be used in Irrigating, Watering, Flooding, or Washing of Grass Lands, to consider, that sufficiently large streams, or collections of water to answer the end intended, never shew any striking mineral impregnations, temporary thickness from matters mechanically suspended, alone excepted, and that the various mineral impregnations, as Calcareous, Chalybeate, Ferruginous or Ochry, Sulphureous, Peaty or Bituminous, Saline, &c. (Vol. I. p. 500) which have been so much insisted on, to the impediment of this Art, exist only in such comparatively small quantities, and are visible only in such small and very *slow running springs*, that the using of such alone, is out of the question, for want of quantity, and that when diluted by admixture with enough of other water, the effect of these impregnations (when really proved to be noxious, which most of them certainly are not) must be quite insensible, as all experience in irrigated districts prove. Perfectly clear waters, or those turbid in any moderate degrees, from Springs, Ponds, or Rivers, are alike useful in irrigating and invigorating the roots of the best natural Grasses, and forcing the most abundant and early crops of these, provided the grassy surfaces have *a sufficient slope* (it is rare that old ridged up grass lands, are found to have too much slope), and the water be run over such in a moderately quick and thin sheet or stream, and away by the drain, during proper periods at once, which are longest in the coldest seasons, and that on shutting the sluices or hatches, the water immediately runs and *drains effectually off the surface*, in every part, and remains so, till the floating is repeated.

By a wise and important provision of the Creator, Grasses

Grasses of the best sorts, occupy a middle place between *aquatics* and *dry land* plants, and it has been found, that alternations, sufficiently often and long repeated, of perfect dry and perfect wet (such as the judicious Irrigator produces), will succeed in destroying aquatics, as perfectly as the plants of the most opposite character: and a well-conducted Water-meadow, of sufficient standing, will be seen to exhibit the most perfect selection of a thick and clean crop, of one class of plants only, that either Nature or Art united, can produce: and which I take to be, a very principal source of the advantage experienced from artificial Irrigation, and which the casual overflowings of Rivers but very imperfectly, and the natural wetness of soils in want of draining, in no degrees supply: tho' so many persons have seemed bent on confounding these, in order to decry this important art.

The *temperature*, or natural degree of heat, of water intended for Irrigation, has been much insisted on by many; and the late Mr. Thomas Davis, of Long-Leat, imagined some years ago, that water, by *running rapidly* in a channel, acquired heat (from what source was never guessed) and by which its value in Irrigation was greatly enhanced. On the publication of this doctrine, the late Duke of Bedford directed a set of experiments to be made, under my care, which consisted in forming even channels of two or three hundred yards in length, with a rapid and pretty uniform descent, from the banks of a large Pond in Woburn Park, and letting out a good stream of water thro' them, having first ascertained the degrees of heat in various parts of the empty channels, and in the water of the Pond, and if these differed at all, letting the water run thro' the channels until the whole had acquired

acquired the same degree of heat; and then, on often repeating the experiment on different days, of placing a very sensible Thermometer, successively in every part of the stream in the channel, and in the stagnant Pond, not the smallest increase of heat could be perceived by the rapid motion, to the further end of the trench. Of course the advice was not followed of losing considerable *level*, to obtain a current, in bringing water on to His Grace's Meadows, and between their different parts, which a very different result to these experiments, might perhaps have warranted: and I have here mentioned the circumstance, with the view of inducing like caution in others, who might be about adopting this principle in making their Meadows. The difference in the degrees of temperature of ordinary Springs is so small, and the temperature of all warm ones so low, as observed Vol. I. p. 487, that absolute *heat* is very little if at all to be regarded, in speaking of Watered Meadows: and yet there cannot be a doubt, that a very considerable part of the invigorating effects of *winter watering*, is produced by the warmth of the water, compared with the more cold and cutting winds and frosty air, that then prevails: since the roots of grass under a film of running water, are preserved from their action, and in case of a frost coming on, and the water being turned off, as soon as a complete cake of ice is formed on the meadow, it may remain thus, during all the severe weather, sheltered from the winds, and yet receiving the benefit of air under the ice, and of light thro' the same.

A distinction should always be made, between the copious waterings that have been spoken of above, either with clear or naturally thickened waters, and those wherein artificial, or *Liquid Manures*, like the

drainings of a Farm-yard and its Sewers, &c. or those of a House or Town, are intended to be thus conveyed on to the Land, to save the labour of Water-carts; since in the latter case, a small quantity of water is sufficient, and even the best adapted for distributing Liquid Manures, enough to dilute them properly, and no more; and except in the case of Sewers from an extensive Town, or the occasional emptying and stirring of a large muddy Pond, it cannot be expected, that any perceptible virtue can be communicated to the whole mass of water used on a regular Meadow, or that if such could be done, that the greater part would not pass off the Meadow again, and be lost: in short, *Irrigation* is not essentially connected with Manuring, in a sensible or tangible form: in some instances, a constant supply of clear water, in others, occasionally turbid, in some, a variable and occasional supply of water mostly turbid, and in others, the water of the smallest rill, or from a Pond artificially impregnated or mixed with fertilizing matters, all have their proportionate effects in improving Grass Crops, when judiciously applied, and to such a degree, that it is to be regretted, that any water should glide uselessly away; except perhaps in the Summer season, when the Crops are growing.

In preparing very wet or boggy land for irrigating, it can seldom happen, that *under-drains* will be proper, as liable to absorb the water, and to blow up, unless such drains can be constructed outside of the Meadow, to intercept the springs or land-soaks in their way to the Meadow: but by laying all the surface into steep ridges, with open drains in each furrow, and surrounding the whole, by others more or less deep, as occasion may require, the most inveterate Bog may

be

be rendered sufficiently dry for irrigating, as Mr. Smith has proved, incontestibly, at Prisley, and in several places in Norfolk, in his Work above quoted, see also his Paper in the 23rd Volume of the Transactions of the Society of Arts: Dr. William Richardson has also printed "A Letter on Irrigation, addressed to Isaac Corry," wherein he shows how Bogs may be prepared for irrigated Crops of Fiorin Grass, by a like simple means.

It is no part of my design, to explain *the practice* of making Water Meadows, but rather to recommend the aid of Professional Men, to those who are about to adopt this Improvement, as the most likely to answer their purpose, in all respects: at the same time that the encouragement thus given to competent Irrigators, will have the best effect, in spreading this inestimable Improvement more generally thro' the County. I am happy in being able to give so respectable a List of *Professional Irrigators*, who either reside in, or have done business in the County, viz.

Mr. John Bartram, of Melborne, near Derby, S E (for nine or ten Persons there, 170 acres, see p. 475).

Mr. Edward Dowdswell, the White Hart, Maulden, near Ampthill, Beds. (for Mr. Rowbottom, at Doveridge).

Mr. John Dowdswell, the Cock, Uttoxeter, Staff. (Mr. Stone, of Boylstone, and Mr. Wooley, of Shirley).

Mr. John Litherland, of Appleby, near Ashby-de-la-Zouch, Leic. S S W (Mr. Moore, of Lullington).

Mr. Thomas Litherland (Son of ditto), of Appleby, near Ashby-de-la-Zouch, Leic. S S W (Mr. Smith and Mr. Ward, of Lullington).

Mr. Edward Manlove, at Henry Smith's, Esq. Norris-hill, Ashby Wolds, near Ashby-de-la-Zouch, W. Leic.

Mr. Thomas Rushton, of Chilcote, near Ashby-de-la-Zouch, Leic. S W (Mr. Thomas Moore, of Lullington).

Mr. John Trig, of Wood Nook, in Sheepshead, Leicestershire (the late Mr. Robert Bakewell of Disley, Rev. Mr. Hall, Risley).

I will now proceed to my Notes on the various Water Meadows in or very near to Derbyshire, taking the places in order, viz.

Appleby; George Moore, Esq. has watered Meadows near to the Mease River, and about the year 1799, brought an Action against the late Joseph Wilkes, Esq. for diverting the Water of the Mease, to water the Upper Heaths in Measham, and afterwards to work a new Cotton-mill, to the injury of these Meadows in Appleby, and cast him in 1*s*. Damages; when a Steam-engine being substituted at the Cotton-Mill, the Measham Meadows were not disturbed, but a few years afterwards, at the sale of part of the late Mr. Wilkes's Estate, they were purchased by Mr. Moore, as will be further noticed below.

Ashby Wolds, Leicestershire; Mr. John Johnson, of Union Lodge, had planned and fenced 50 acres for watering, and part executed them, supplied principally from the corners of the large Reservoir for the Ashby-de-la-Zouch Canal, situate on his Farm, and which runs over during most of the year. Henry Smith, Esq. of Norris-hill, has made two acres of Water-meadow, under Edward Manlove, in the site of an ancient Fish-pool.

Aston

Aston in Sudbury; Mr. Samuel Lawley has a Meadow.

Barton Blount; Mr. John Holland, of Barton Fields: here, instead of proper carriages and sloping Panes to receive the Water, considerable expense in draining and levelling had been incurred, with Banks and Sluices, to *pen* the water on to a Meadow at times, like so many Ponds!, under this absurd management, it was said to me, "*the water is poor*, and does no good;" and when I was there, a good coat of Dung was spreading on this Meadow: Spring-feeding has not been attempted; the Hay is good, and is mowed early.

Belper; Mr. Joseph Gratian: the very successful irrigation of his Garden has been mentioned, p. 209.

Blackwall; Mr. John Blackwall, by means of one of the runs from his Land Drains, washes out the Drains in his Farm-yards and Premises, over eight acres of Grass, which has been much improved thereby.

Boylstone; Mr. Robert Stone has 22 acres of Meadow, very well made, by John Dowdswell, who was paid three Guineas per acre for the Ground-work, exclusive of Carting; the Flood-gates, Hatches, Ale, &c. cost 2*l.* per acre, besides a large and substantial main Sluice, which cost 45*l.* and is calculated to command 40 acres in all, the whole of which is intended to be watered. This Meadow being close eat in October, the cuts are cleared up, and advantage taken of the first floods afterwards, and the watering is continued, with proper intervals, thro' all the winter; in the beginning of March the Sheep and Lambs are turned in, and after a watering, the Milch Cows, until about the 12th of May, when, after another wetting, it is laid for Hay, and mowed

in six weeks after, 1½ ton (30×120lb.) to the acre: after a slight wetting, the Edish proves abundant, and excellent for the Milch Cows. This Meadow has enabled a much more profitable system to be pursued on Mr. S.'s Arable Land. It is fortunate for himself and the Country, that Mr. S. did not give way to the persuasion of a Gentleman, who having had a boggy Meadow, watered without being raised at all, and been forced to abandon the watering, on hearing of Mr. S.'s intentions, rode several miles on purpose to dissuade him from attempting Irrigation! Such is the unfortunate effect of mistakes, in the principles or application of any new Art, that is to be introduced!

Brailsford; Mr. Edward S. Cox, has 26 acres watered from by catch-work, from the Wash of the Town; the 11 acre piece next the Town, is Spring-fed from the 1st of April to the 15th of May, and in less than six weeks cuts two tons (40×120lb.) of Hay per acre; the after-grass is usually fed down three times, and the watering begun at Christmas, and continues whenever there is water, through the Winter.

Brislingcote, ½*m*. E of the Village.

Burrow Fields in Walton; Mr. Robert Lea, by means of temporary cuts, turns the Wash of his Yards and Premises over eight acres of Land, frequently changing the cuts, and has found the improvement so great, that when I was there, he was extending these cuts into another Field.

Caldwell in Stapenhill; Mr. Thomas Moss and others.

Church Gresley; Mr. Daniel Fletcher.

Croxall; Mr. John Garman of Broad Field Farm, has 34 acres watered, which were drained some time previously: it is mostly grazed by his Dairy Cows.

Mr.

Mr. William Garman of Persal Pits, was intending, when I was there, to water 18 acres from the large old Marl-pit Pond. Thomas Princep, Esq. has also some irrigated Meadows, I. believe.

Cubley; Mr. William Morley of Brook Farm, ¼*m.* S.

Culland in Brailsford; Mr. William Cox has more than 50 acres watered by catch-work, well done and managed; great part of this Land was boggy and foul in the extreme, it has now but very few Rushes, and no Sedge-grass Tussocks: 20 acres of it is always grazed, because subject to Summer Floods; near two tons of Hay per acre are cut from the remainder, at full six weeks lying.

Derby Hills, in Castle Donnington Parish, E of Ticknall: Mr. Thomas Thompson and Mr. David Tomlinson, about 1805, diverted Ticknall Brook, and made nine acres of good catch-work Meadows.

Doveridge; Mr. Thomas Rowbottom of Ley Hall, has 12 acres of Meadow, made about 1805, by Edward Dowdswell, which are pretty well laid up, and are free of aquatic Weeds. Mr. R. begins in October or November to water, and continues till near the end of March, then feeds with Ewes and Lambs, but sometimes with Dairy Cows, which last answer admirably in their Milk: it is usually laid for Hay from the 20th of May to the 15th of July (six or eight weeks), and large Crops are cut, of good quality: then the Meadows are wetted if the season is dry, and fed with Cows in the Autumn.

Ednaston; at Spinneyford Brook, formerly, very ill done and abandoned, see page 458.

Hales Green in Shirley; Mr. Joseph Allen, a catch-work Meadow.

Hartshorn; Mr. John Glover at Short-hazles Farm, ¾*m.* S of

S of the Town, a catch-work Meadow. Thomas Hassall, Esq. ten acres, watered in the Winter, Spring feed with Sheep, from April till the middle of May; afterwards mow 1¼ ton per acre; Autumn feed with Sheep, which are *not rotted* by this irrigated Grass, in Spring or Autumn!—Mr. William Ravens has ten acres watered, ¼*m.* N W of the Town.

Ingleby; Mr. Robert Charles Greaves has 17 acres of catch-work Meadow, made in 1789, having been previously cold Swerd, highly ridged up; it was first Under-drained, and then ploughed twice and cross'd, and was then levelled by a sort of Horse-shovel four feet wide, which moved the earth from the ridges to the furrows, after which the ridges were deep Ploughed, and Limed, and Manured, and the whole was sown with Grass-seeds, and when swerded, the cuts were formed. It is watered during the Autumn and Winter months, from the Fish-ponds above, which are fed by small streams from Pastures and Woodlands: no Spring feeding, but mow usually about the first week in July, 1¼ ton per acre of very good Hay, but rather too coarse for well-kept Nag Horses: the After-grass is fed by Sheep, and the *rot* has never been experienced in consequence!, since some stagnant places were better drained, by deepening the Irrigation Cuts. No Manure has been laid on this Meadow since it was formed, and the present Crops are better than ever.

Kings Newton; several, see *Melborne*.

Kirk Ireton; Mr. John Rensham occupies several small Fields E of the Town, belonging to Charles Hurt, Esq., which since about the year 1770 have been watered

watered in catch-work, with the Wash of the Town, and produce surprizing Crops of Grass.

Kniveton; the Rev. William Hurd, a catch-work Meadow.

Longford; Edward Coke, Esq. had 40 acres formerly, of flat, boggy, imperfectly formed Meadows, see p. 459; at first these produced 2½ tons of coarse Hay per acre, but in a few years this became so coarse as to be of no value, except on a small part, which happening to have been laid more up, had improved in its herbage: only three acres are now watered, occasionally, with the Wash of the Farm-Yards. On the discontinuance of the watering, the flat Meadows were drained, and are so much improved thereby, that they now carry two beasts to an acre.

Lullington; Mr. Thomas Moore has 70 acres of watered Meadow, which were first drained, and part of the works made under John Litherland, the remainder under Thomas Rushton, who also manages them: some parts are Spring-fed, and mown in ten or eleven weeks after. Mr. Joseph Smith of Woodfields Farm, has 13 acres of Meadow made by Thomas Litherland, in 1801, which answers well. Mr. John Ward has four acres, made by Thomas Litherland.

Marchington, in Staffordshire; S and S E of the Town, are several watered Meadows, some of them made many years ago.

Markeaton; Francis N. C. Mundy, Esq. has 33 acres of Water-meadow, which were made under the late Thomas Riley from Shropshire, and which appeared to double the value of the Land; at present it is let to an Inn-keeper in Derby. Mr. M. seemed

to

to think, that clayey Water-meadows will in time become rushy; and he had heard, that its Hay contributed to the breaking of the winds of hack and hunter Horses, which he seemed to believe to be probable. About a furlong N E of Mackworth Church, a Gate shutting across the Brook to pen it, in the manner of the single upper Gate of a Lock on Canals, raises the water occasionally for a Meadow of 11 acres, which Mr. M. had made for the late Mr. Thomas Smith his tenant, now Mr. William Smith, but lieing very flat, and the Panes being 50 or 60 yards wide, before the water could get again off the Grass, it became so coarse and rushy, that the watering of it is now discontinued, except while very thick in floods, by way of manuring it.

Measham; the late Joseph Wilkes, Esq. among others of his spirited improvements in this Parish, which have been slightly noticed at page 362, soon after the year 1793, constructed a Sluice, and a spacious carriage for the water of the Mease, or Swepson Brook, at the Measham and Hinkley Turnpike-road, carrying it nearly on a level past Ilot (where the Ashby-de-la-Zouch Canal now passes over it on a sunk culvert) and forwards to some poor Lands, called the Upper Heaths, in the S E part of Measham Parish, where the Works for watering a large range of Fields in a very good style, were constructed, and with a corresponding degree of improvement. In pursuance of Mr. W.'s Will, this part of his Estate was sold, and George Moore, Esq. of Appleby, who had some years before sustained an Action against Mr. W. on account of these Meadows, as already mentioned, p. 468, became the purchaser of the greater part of these

these Meadows, and has still farther improved them, and waters them, to the full extent of Mr. Wilkes's original and great designs.

Mr. Moore has now 120 acres of irrigated Meadows in Measham, and lets to Mr. Robert Proudman of Ilot 70 acres, consisting of watered and upland Meadows, on the Coal-measures, without any Buildings but a Barn, at 5*l.* per acre throughout! Who, after such an example, should hesitate on adopting this most capital of improvements? I saw the Sheep in these Meadows in November 1809, the Autumn *rotting* of Sheep on them being unknown. Edward Mammatt, Esq. (the Grandson-in-Law and successor of Mr. Wilkes) has constructed some very good catch-water Meadows on the S side of the Town, and availed himself of its Sewers and drainage into the Willesley Brook.

Melborne: about the year 1793 Mr. Francis Robinson employed John Bartram to erect a main Sluice across the Brook, about 100 yards below Melborne Mill, and since that, a double one about ¼ *m.* below the new Bridge S E of Kings Newton, has been erected (which cost 80*l.*) and another on the Wilson Brook, that joins this Stream, by means of which Sluices and Streams, Bartram has constructed the following Meadows, in Melborne Parish, viz. for Mr. John Brigg 11 acres, Mr. William Carter 11 acres, Mr. William Drake 11 acres, Mr. William Dunicliff 12 acres, Mr. John Earp 20 acres, Earl Moira 25 acres, Mr. Francis Robinson 50 acres, Mr. Thomas Robinson 14 acres, Mr. William Taylor 16 acres, Mr. John Wright 11 acres, and some others smaller quantities; the general Works being at the joint expense

pense of the above Occupiers of the Lands (though *Tenants at Will*, and their Landlords contributing nothing, I understand), and the particular Works for watering each person's Land was done at their own expense, under Bartram, who also continues to manage the whole by the help of two men, at the rate of 4*s*. per acre yearly, and a quart of Ale, with small Beer each man per day, while scouring out the Cuts and attending the water: the watering is begun in November, and continued till the first of May, Spring-feeding not being practised; and every other year they are mown about the first of July, yielding 1¼ ton, or rather less per acre, of good Hay; the Aftermath being fed by Dairy Cows, and on the alternate years they are grazed after May-day by these Cows, through the Summer, and with Horses and Sheep occasionally; the latter are invariably *rotted*, and are therefore purchased from Sherwood Forest, and fatted off each year, both Ewes and Lambs. Mr. Francis Robinson dresses his Meadows every other year, with 15 three-horse Cart-loads of Dung per acre.

Before these improvements were attempted, the Vale, which is very flat, was boggy, rushy and flaggy, and the expense appeared too great for the Farmers, to lay up the Beds, in the perfect manner which they ought to have been, particularly near the Town where they began, and these are said not to bear the water so well as they do lower, in Kings Newton.

I could not but lament, when viewing these Meadows, to see such meritorious exertions on the part of Tenants, so inadequately seconded, as in this case, and heartily wish, I could be the means of showing to the

the Owners of these Lands, the necessity, whether considering their own, or Tenants', or the Country's interest, of either bearing the expense of laying up these Meadows in an effective manner, or of granting adequate Leases, on condition of such being done by the Tenants, the general Works appearing to be very adequate, and substantially done, and, as well as the laying of the Fields into proper shapes, and raising good Fences, which are the most expensive and considerable of the difficulties, in making new Water-meadows, in most inclosed situations.

Mellor; Samuel Oldknow, Esq. raises the Cess-pool Water from his Cotton-Mill Apprentice-House and Works, by a Chain-pump, to water a small Paddock, and the remainder is carried in Water-carts to irrigate his Pasture Land, and from which much benefit is perceived.

Mickleover; Mr. Samuel Rowland has a meadow SE of the Town, washt or irrigated by its Drainings, which he Spring-feeds, and afterwards cuts two tons of Hay per acre: another washt Meadow W of the Road, is less improved by watering.

Newhall; Mr. John Withnall of Brislingcote, has a watered Meadow here.

Newton-Solney; Mr. John Mellor of Barton Banks, on the Hartshorn Brook, made a small Meadow in a pretty good style, in 1807.

Oakthorpe; ½ *m*. SW in Measham, is a watered Meadow.

Osmaston; John Berrisford, Esq. of Osmaston Cottage, has four acres of catch-work Meadow, SW of the Derby and Ashburne Road, which he Spring-feeds, and in six or eight weeks after, cuts one ton and a

half

half of Hay. The Seeds of Docks and other Weeds, brought down from some foul Lands and Ditches above, give much trouble in Weeding. A part of this Meadow appearing hide-bound and poor, some years ago, it was ploughed over, and the furrows then turned back by hand, taking away a furrow here and there, to make room; by which process it was cured of this defect, and much improved.

At the south-east end of the Town, I saw a Field washt by the Water from a Farm-yard, &c.: and near Tinker's Inn, another watered in a very complete catch-work, from the Water of the Turnpike-road.

Packington; in the intermixed Lands of Derbyshire and Leicestershire; in this Parish, there are several watered Meadows.

Parwich; for ¾ *m.* below the Town, and 150 yards wide on each side of the small Brook, the Meadows, belonging to 10 Farms, have been watered, time immemorial, in rather a rude way: they begin in Autumn, as soon as the crops of After-grass are off, and the Springs from the Limestone Hills above, begin to burst out, and continue until the beginning of May, never taking off the water in the interval, and yet the grass is pretty good, and with very few aquatics intermixed: two large Springs that usually burst in the Autumn from the projecting 4th Limestone Rock, E of the Church, and are dry all the Summer (Vol. I. p. 505), are esteemed to be warmer, and do more good to the Meadows near, than the water of the Brook. Some who don't Spring-feed, mow twice in the course of the Summer, and get three tons of Hay per acre: the Hay from these Meadows usually sells at 3*l.* per ton, but in the Spring of 1808 it fetched Six Guineas. Sir Richard Levinge,

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an Irish Baronet, is the principal Proprietor of these Meadows. It seems surprising, that so obvious an improvement as this, had not spread more, and long ago became general, in similar situations.

Radburne; Mr. John Arnold has 19 acres watered, S W of the Church, and Mr. Joseph Wragg 22 acres, 1 *m.* S of the Church.

Ravenstone; Messrs. Robert and Richard Cresswell, have 35 acres of Meadow, on a clayey Gravel Soil, which they Spring-feed by Ewes and Lambs, and afterwards mow 1¼ to 2 tons of Hay per acre, tho' their water is rather deficient in quantity.

Risley; the Rev. John Henlock Hall, has four small Meadows S W of the Town, washt by its Drainings, made by John Trig in 1807; they seem rather too flat, but for occasional thick water, this is a less evil, than where greater quantities of clear water are to be used.

Rodsley, in Longford; Mr. Sampson Holland has a Meadow.

Rosliston; Mr. Samuel Killingsly has a Meadow, ½ *m.* W of the Town.

Sapperton; Mr. Henry Yates has a Meadow.

Shirley; Mr. William Thompson at the Common, had a Meadow formerly; Mr. Wooley of the Old Park, a Meadow, made by John Dowdswell.

Stapenhill; Mr. Thomas Lea, has 15 acres of watered Meadow.

Sudbury; Mr. William Fearn, of Mackley, has a Meadow.—Lord Vernon has seven acres of Meadow S E of the Hall, watered for several years past from the surplus of a Reservoir in the Park, fed by a carriage two miles long, the stream of which is much too small to effectually water this Meadow, which neverthe-

nevertheless, is situate just below the head of a very large Pond, whence it might and ought to be irrigated effectually. $\frac{1}{2}$ *m.* W of this, his Lordship has 16 acres of watered Meadow, formerly in hand, but now let to Mr. Joseph Stanley; the beds here are seven yards wide, and much too flat; Burnet, Meadow-sweet, Crow-foot and Hard-Iron prevail in consequence, where the best Grasses only ought to be found, and the produce is in consequence deficient, and inferior, to what the command of water here might ensure, on a properly raised Meadow.

Tibshelf; Mr. Benjamin Chambers, at the W end of the Town, has several catch-water Meadows, very well contrived and executed, for using the wash of the Town and the Roads.

Uttoxeter, Staffordshire; Mr. Thomas Goodrich and Mr. Anthony Rudd have several good watered Meadows, S E of the Town.

Walton on Trent; Mr. John Garner has a Meadow.

Wessington in Crich; Mr. Thomas Hill of Holly-House has a Meadow, near to Lindow Lane.

Willington, $\frac{1}{4}$*m.* N W of the Town; a Meadow.

Wilsley; Mr. Joseph Clarke, about 1780, made a 12 acre catch-work Meadow N of the Town, since which, a high Embankment for the Ashby-de-la-Zouch Rail-way has been made across this Meadow, and cut it in two, and when two Culverts made under it, at the sides of the Vale, to carry water to the lower parts, were so very improperly done, that they soon after fell in, and remain yet in that state! to the no small disgrace of the Company, and by which the watering of that part is entirely prevented. The upper Meadow is Spring-fed till the beginning of May, and mown at the end of July; the crops are but

but middling on the flatter parts, which are rushy, on a clayey soil.

Windley; Mr. Robert Danah, in 1809, constructed a substantial sluice, for raising the water of the Turnditch Brook to water a Meadow E of his House.

When the very great advantages reaped from Irrigation in most of the above cases, are considered, it is much to be lamented, that many Valleys having good opportunities for this improvement, remain in a shamefully neglected state, as at Barton-fields, Ednaston, Milton, Repton, &c. &c.: and that a vast many others might be further and highly improved, by making use of the streams that now run uselessly thro' them.

*Reservoirs* on a large scale have not yet been constructed in this District, for the purposes of Irrigation, as recommended by William Jessop, Esq. of Butterley Hall; see Mr. Pitt's Staffordshire Report, p. 118. but I hope, that when the many streams that now run idle, shall be applied to this most beneficial purpose of producing very large grass Crops, perpetually, *without manure*, that the further extension of so beneficial a System will be entered on, by reserves of water, expressly made for this purpose.

*Plans* of Meadows, and estimates of expense, I have not attempted, thinking, that no one should attempt to set out or construct a Meadow, who had not seen many such, and by that means have become practically acquainted with the subject; but as this would be often attended with much delay and expense to Farmers who have opportunities, and are disposed to adopt this improvement, the best way in this case (as in

 Draining),

Draining), is to call-in the aid of some Professional Man, as observed, p. 467: at the same time, the perusal of Mr. Smith's Work on the subject, already quoted, might be proper, both to learn somewhat of the general principles on which Water-meadows should be constructed, and the best modes of subsequent management.

*Clauses in Acts of Parliament* for promoting Irrigation:—I am not aware of any such applying to Derbyshire; nor does it appear from Mr. William Pitt's Surveys, that it is known in Staffordshire or Leicestershire, or in any others in this part of England, altho' practised thirteen years previous to the date of the latter Report, in Bedfordshire, at the time of Inclosures, as Mr. Batchelor has slightly hinted in his Report on that County, page 488, but without any adequate account or commendation of the design of thus removing, what he considers, page 492, to be foremost in the impediments to the adoption of this improvement, viz. "the intermixture of property, and the opposing interests of various parties;" and as little seems to be generally known on the subject of these Clauses or Proceedings, I hope that I shall be excused for introducing some account of them in this place.

The very considerable difficulties and expenses, which attended the cutting up of the existing Farms and Fields, and in levelling old Fences and Ditches, and making new ones, raising Roads to pass the new Water-carriages under them, &c. &c. on the late Duke of Bedford's Estate in Woburn, when he commenced his extensive Improvements there by Irrigation (as mentioned page 460), suggested to His Grace the propriety

priety, of lessening or preventing these in future, in the newly inclosed Lands in the adjoining Parish of Crawley, which belonged principally to him, and for the Inclosure of which an Act was then soliciting, by ascertaining the practicability of the utmost extent of these Improvements, there, as well as the best directions for all the main Drains, before the Commissioners should set out the Roads and Brooks, or consider of their Allotments; and in consequence, I received directions from His Grace, to survey and level, and mark out all such principal lines of Feeders, Cuts, and Drains throughout the Parish, as could, in any event, appear necessary or useful: and in the mean time, some additions were suggested by me, in the usual Clause in the Bill, directing the Commissioners to set out Drains, which were revised by Mr. Thomas Stone, His Grace's Surveyor and Commissioner, and received the sanction of the Legislature.

The Land Surveyor afterwards appointed by the Commissioners, as he proceeded, ascertained and laid down, by blue dotted lines on his Map, all my Irrigation and Drainage Lines, and which the Commissioners so far approved, as to make those lines the exact boundaries of their Allotments to the different Proprietors, except in one or two instances, where some proper sized Fields might be made beyond these lines, and yet allow of the cutting and fencing of the proposed Carriage lines, without material loss in fencing, or the forming of improper sized or shaped Fields.

A further portion of the low Lands having come to His Grace, by Purchases and Exchanges, I proceeded afterwards, under his directions, to lay out and fence the whole of his Allotments, with a view to the future Irrigation of the whole space within the upper lines of Car-

 riages,

riages, carrying the same views to the subdivision Fences, and making proper culverts and arches under all the Public or Private Roads, at or before the time that such Roads were formed, and under the Gateways, with proper puddled Walls and Heads for affixing Sluices at a future time, against all such arches as appeared ever likely to need them, for flooding the adjoining Fields, or conveying the water forwards to others: in short, looking forwards in all works then performing, like Roads, Arches, Fences, &c. to the utmost possible use of the water: His Grace and myself being at the same time well aware, that the quantity of the Crawley water was not adequate to water, even a quarter of the space thus included, at any one time effectually, but having thus made provision for carrying the water with almost equal facility to any one Field, of several scores, those whose soils and situations in the several Farms, best suited them for permanent Meadows, might be so appropriated, and the *temporary irrigation* of Lands intended to be broken up again, might be practised, and from which (even the watering of Seeds in a course of aration) His Grace expected to derive considerable advantages.

The progress of these Works, and the prospects they opened, appeared so very satisfactory to His Grace, that when Bills were preparing for the Inclosures of *Ridgemont*, *Maulden*, *Houghton-Regis*, in the Spring of 1796, he directed me to digest and prepare more particular Clauses for similar Surveys and Allotments to be made, with a view to the most extended and varied system of Irrigation that was practicable in those Parishes, in which he possessed a great majority of the Property; the Clauses so prepared, met the approbation of the other Proprietors and of the Legislature,

lature, with only some slight verbal variations from each other. That for Maulden E of Ampthill, where His Grace's most striking Agricultural Improvements, by Draining, Irrigating, Marling, &c. &c. were afterwards made, being as follows (p. 15 and 16 of the printed Act), viz.

"And whereas certain parts of the Parish of Maulden might be greatly improved, and converted by Irrigation or Watering into valuable Meadow Land, if the waters of certain Springs, Rivulets, and Brooks, in the said Parish, were at times diverted and carried along the declivity of the Hills, in Carriages or Ditches on the proper levels, for such purpose; and whereas such Carriages must, in some instances, in their course to the Land intended to be watered, pass through and over the Estate and Lands of other persons, and in some instances through old Inclosures: and whereas certain Lands within the said Parish, might also be greatly improved by proper and competent Drains or Ditches being cut and continued through the Valleys and lowest Ground; be it therefore enacted, that the said Commissioners, shall and may direct and appoint some competent person (making him a reasonable compensation* for his trouble therein) to take the levels, and examine the practicability and extent of the improvements, which may be made by Irrigation and Drainage, within the said Parish of Maulden, and to report the same to the said Commissioners, who shall

* Although regularly *appointed* by the different Commissioners in the above three Parishes, to level and set out, the extensive Irrigation and Drainage Lines and Works, under these Clauses, and which were fully adopted and acted on in their Allotments and Awards, it is but justice to myself to state, that no demand was ever made by me, nor was any offer made by these Commissioners, of the least remuneration for these services.

 be

be and are hereby authorized and empowered, to scour out, deepen, straighten, divert, alter, change, raise, sink, or embank all or any of the ancient Brooks, Rivulets, Springs, Ditches, and Watercourses, within the said Parish, for the purposes aforesaid, and to set out, appoint, construct, and make all such new Carriages, Ditches, Trenches, Drains, Tunnels, Bridges, Water Gates, Sluices, and Dams, as well in, through, over, and upon the Lands and Grounds hereby intended to be divided and inclosed as aforesaid, as in, over, through, and upon any ancient Inclosures, or other Lands or Grounds, within the said Parish, or across and under any Public or Private Road, as they shall judge necessary, for the purpose of irrigating or draining any of the Lands and Grounds hereby intended to be divided and inclosed, which from their situation may be capable of such improvement; and the said Commissioners are hereby authorized and required to make such satisfaction as they shall think proper, to the Proprietor or Proprietors of such ancient Inclosures, and other Lands, not hereby intended to be divided and inclosed, for any damage done to their Lands in the constructing, making, and maintaining of any Carriages, Ditches, Watercourses, Trenches, Drains, Tunnels, Bridges, Water Gates, Sluices, or Dams, in, through, or thereon; and the said Commissioners shall apportion and assess the expense of satisfaction for damage done to the old Inclosures, and of the digging, making, and constructing of the necessary Carriages, Ditches, Tunnels, Drains, Bridges, Water Gates, Sluices, or Dams, for the purpose of conveying the water upon and taking the same again off the Land as aforesaid, upon such of the said Proprietors to whom the said Lands shall be allotted and belong,

in

in proportion to the benefits their Estates will severally derive from such Irrigation and Drainage, and the money so assessed shall be levied and recovered in the same manner as the money for the purpose of passing this Act, and carrying the same into execution, is hereinafter directed to be levied and raised; and the said Commissioners are hereby authorized, in and by their Award hereinafter mentioned, to order, direct, and appoint, at whose expense, at what time, and in what manner the said Carriages, Ditches, Tunnels, Drains, Bridges, Water Gates, Sluices, Banks, Dams, and other requisites for Irrigation and Draining shall thereafter severally be repaired, scoured out, cleansed, maintained and renewed, and at what times and in what proportions the said Water shall be used by the several Proprietors for the purpose of irrigation as aforesaid; and the several Proprietors of Land irrigated as aforesaid, and their respective servants, shall thereafter, at such times as the said Commissioners shall in their said award direct, have free access in, to, and upon the Estates of any other person, doing however as little damage as may be, and keeping and passing along upon the banks of such of the Carriages, Ditches, Rivulets, or Brooks, which bring or convey the Water to or upon their respective Lands, and along the banks of such Drains, Ditches, or Brooks as convey the Water from or off the said Lands, for the purpose of opening, shutting, or regulating the Water Gates or Sluices, or of removing any obstructions to the course of the Waters."

When the Commissioners for Maulden Inclosure were proceeding, in pursuance of the above Clause, a stop was attempted to be put to the whole, by the Agents of a Lady, a Life Proprietor of the Site of

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an ancient and disused *Water-mill*, in an adjoining Parish, who had, it was contended, the right, which it was determined to assert, of *at any time* rebuilding her Mill (tho' quite down for a great many years before), and taking *all the waters without diminution*, which it was intended thus to apply to Irrigation. The parties were, however, brought to consent to submit their claim to the Commissioners, and abide their determination; and in consequence, an allotment in Land was given in exchange or bar of this claim, to parties, who could not in any way but this, under the sanction of the Act, have been so bound, perhaps, as the Law (or rather, perhaps, its absurd construction in favour of Mill-owners) now stands, as to have made it prudent to have proceeded with these improvements.

In Houghton-Regis, at the foot of the Dunstable Chalk Hills, the provisions of the Clause, for taking strips of intervening old Inclosures, in exchange for other allotments of Land (after due notice), in order to carry forwards the upper Cuts or Carriages on the proper levels, to open-field Lands beyond them, were acted on, in two or three instances, and for new Drains in the lowest ground in other old Inclosures: and it so happened, in all these four Parishes, Crawley, Ridgemont, Maulden, and Houghton-Regis, after the setting out of the Allotments, that the few Proprietors who had Allotments made to them below the water-levels, from not being impressed with high notions of the benefits to be derived from the use of the Water, but listening rather to the ill-directed advice of others, solicited the Commissioners to assign the entire right and use of the Water to the Duke of Bedford, and charge him with all expenses incurred in consequence of

of the Clauses relating thereto; and thus did His Grace become possessed, by the Commissioners' Awards, of the undisputed right at any time, of carrying Irrigation into effect, over several hundred acres of land, in great part ready prepared for the purpose: I heartily wish, that 500 spirited Improvers in England, had similar facilities of extending this improvement! and shall conclude this digression, by remarking, on the extraordinary circumstance of Mr. Batchelor being entirely silent, in his Bedfordshire Report, on the powers thus acquired, and on the Meadows actually formed under them, in each of these four Parishes, except on the since-abandoned Meadow in Ridgemont, the improper mention of which I have already alluded to in page 462.

That *Water-mills* are often " a dreadful nuisance" to the Agriculturist, cannot be doubted, and in the examination of several districts in England, it has struck me, that the annual value of damage done to adjoining Lands, much exceeds the gross rental of the Mills; in this and other mountainous Counties the damage sustained is comparatively small, to what it is in flatter Countries, partly owing to the rapid falls of the Valleys, not admitting of Mill-dams penning so far back, but more, from the system that prevails in such districts, of placing the principal Weir in the Brook or River-course itself, and conducting only a small Goit, Lead, or Feeder therefrom to the Mill, close along the side of the high ground, with a tall sluice or shuttle at the entrance of such Goit; by which, floods are shut entirely out of the Goits or Mill-dams, and are forced at once over the Weirs, and pursue their natural channels, instead of such being conducted into, and frequently swelling the Mill-dams, and causing them, as every night's

night's water also does, in numerous places, to rise very near to, if not actually to overflow the surfaces, of acres of valuable Lands, which are thereby rendered useless swamps.

Large *Weirs*, of difficult and expensive erection, are seen across some of the Rivers in this district, as in Allsaints in Derby, at Belper, of a very complete kind, as mentioned page 398. At Matlock Bath Cotton and Paper-Mills, which last is convex down the stream, instead of up it, as is more common, &c. At Furnace-mill, near Jow-hole in Bugsworth, I saw a *circular Weir* or Well-fall, which is an admirable contrivance for letting down waste waters from any height, without wear or damage: their construction is described in the article *Canal*, in Dr. Rees' Cyclopædia.

In the article above referred to, published in 1805, I suggested, and detailed a Plan for *Improving a Valley*, by destroying the mischievous Dams of the present Water-mills, thro' a considerable length of a Valley, and forming new cuts nearly on the level, along each side of the Valley, for considerable distances, with proper and secure Weirs and Well-falls; from which elevated new Cuts, more effective over-shot Mills might be supplied than the present ones, and with such inconsiderable portions of the water now consumed or let down by them, that ample quantities would remain for Irrigation and for supplying Canals, in many instances.

It may not be improper, while I am on this subject, further to mention, that in 1809, W. P. Taunton, Esq. having just then purchased a large Water-mill on the Avon River at Ringwood, in Hampshire, on the advice of Mr. William Smith, projected a Scheme, and

and gave the necessary notices for an Act, for carrying into effect an extensive Plan of the above kind, in which it was proposed to suffer the whole of the River to be diverted, whenever necessary, into two spacious Canals, cut along the sides of the Hills, from the tail of the Mill next above Ringwood-mill, to the commencement of the Dam of that next below it, from whence several thousand acres might, if I mistake not, have been effectually watered, which were then arable, and even waste lands, some of them: asking in return, a small per centage *on the Improvement* only, that such water might effect, and commencing only, after it should actually have been experienced, according to rates to be ascertained by Commissioners to be named in the proposed Act, and according to principles and regulations therein to be provided, as well as for all necessary Exchanges and Alterations of the Property in the Valley, for laying it out to the most perfect advantage for watering. Altho' nothing further was, I believe, done in this business, I lament, that the press of matter relating to this County, will not permit of preserving here, a copy of the whole of Mr. T.'s printed Prospectus, or Proposals made to the Land Owners in Ringwood, &c.

Instead of bringing *Mill-dams* close to the Mill-buildings, as is often done in the South, to endanger oversetting them by any slip of the Earth, and making them always damp, a considerable length of close planked Trunk is here generally laid thro' the bank or Dam-head, much below the full head of water; and an upright trunk rising therefrom, close to the Mill wheel, has the penstock in it, from whence the wheel is supplied.

At Jow-hole, a small stream from the opposite side

of

of the Goyte River, is conveyed into the Dam by an inverted Syphon of Iron Pipes. Great lengths of Wooden Troughs were made, supported on Trestles, for bringing a collateral stream into the Dam at Mill-houses, S of Wirksworth. Large Water Wheels, of 51 feet diameter, are in use at Combs in Chisworth: Kelstedge Wheel in Ashover, is 35 feet diam. At Chedleton, in Staffordshire, very large undershot Wheels, without any coverings, are in use on the Churnet River.

At Castleton, the only *Soke-mill*, or that at which the Tenants of the Manor are compelled to grind their Corn and pay toll, yet remains, which I heard of in Derbyshire.

*Wind-mills*, some of them of considerable dimensions, are in use in Alderwasley, Alfreton, Ashburne, Belper, Belph, Bolsover, Bredsall, Calow, Chelaston, Chesterfield, Clown, Codnor, Dale-Abbey (Hag), Heage, Heanor, Horsley (Park), Ilkeston 2, Kilburne, Knitaker, Long-Eaton, Losco, Melborne 2, Mickleover, Newbold, New Brampton, Newhall, Ockbrook, Pinxton, Plesley, Ripley, Riseley, Shipley (Wood), Smalley, Spitewinter (Span-car), Smithsby, South-Normanton, Spinkhill, Swathwick, Temple-Normanton, Tibshelf, West-Hallam, Whittington, Wirksworth, &c. by which a good deal of the Flour of the District is ground.

Within a few years past, *Steam-engine* Flour-mills have been erected at Blackwell (Park-mill), Dronfield, Measham, Mosborough, Pinxton, Wirksworth, &c. principally as auxiliaries to Water-mills, in the Summer seasons, when Water is short. The Mill in Measham was contrived by the late Joseph Wilkes, Esq. to work only during the night, by the same Steam-engine which during the day works a Cotton-mill.

The

The *Millwrights* whom I noted, are Mr. William Molesdale, of St. Werberg, Derby; Mr. J. Nailor, of Whittington, and Mr. Snowden Topham, of St. Alkmund, Derby.

The *Steam-engine Makers*, the Butterley Company at Ripley, Mr. James Fox, of St. Mary, Derby, Mr. William Molesdale, of St. Werberg, Derby, and Mr. Joseph Thompson, of Ashover.

I saw no instance of *Irrigating from the Navigable Canals* in this County, nor any kind of *Machinery* used to raise Water for watering, except at Mr. Oldknow's, at Mellor Mills, page 477.

CHAP.

## CHAP. XIII.

### EMBANKMENTS.

THE low valuable Meadows, subject to be overflowed by the sudden rises of the Dove River, have been mentioned, page 176, and I have further to remark here, that a general system of Embanking this River, and all its collateral Streams, on the principles explained by a Plate in Mr. William Pitt's Leicestershire Report, p. 213, with the addition of proper Sluices or close-shutting Valves through these, above each collateral Stream for letting out the water accumulated by Rains or soakage, so soon as the Flood has subsided, and with other Sluices, in proper situations for letting in the Flood Waters, occasionally, when most charged with Soil, and the Crops are off the ground, to deposit their Sediment or *Warp*, could not fail of improving these Meadows in a high degree. The whole of the Vale of the Trent across this County, and the lower part of the Vale of the Derwent, are in like manner subject to be flooded, but less frequently than that of the Dove: yet here also, Embankments would prove very serviceable. Mr. Pitt states (p. 213) that he did not meet with any Embankments against Floods in Leicestershire; he must, however, have overlooked the small Brook which goes down from Castle Donnington into the Trent, which is embanked, where it crosses the London Road, as most Travellers to Derby must, I think, have observed.

The

The Earl of Harrington made some attempts about the year 1790, to embank his Paddocks in Elvaston, against the Floods of the Derwent, but the same was not effectually done until 1807.

At Burrowash Mill, an Island of several acres in the channel of the Derwent is embanked; at Great Wilne I also saw Embankments against the Floods of this River.

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[*Note.* Where no Volume is expressed, the Second, or present one, is meant.]


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